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ACC NR: AP6032020 SOURCE CODE: UR/0386/66/004/006/0213/0216

AUTHOR: Kitayeva, V. F.; Osipov, Yu. I.; Sobolev, N. N.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Electron temperature in the electric discharge used for the argon ion laser

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 6, 1966, 213-216

TOPIC TAGS: gas laser, argon, electron temperature, electron density, electric discharge

ABSTRACT: This is a continuation of an earlier investigation (Dokl. AN SSSR, in press) of the charged-particle concentration and the gas temperature in argon under conditions typical of the operation of a continuously operating ionic argon laser. The results indicated that the decisive influence on the ion motion in the discharge column is exerted by the drift of the ions to the wall and their recombination. The present investigation was devoted to a determination of the electron temperature in a discharge of this type. Measurements were made of the half-width of the Ar II lines radiated transverse to the discharge in a tube of 2.8 mm diameter and ~40 cm length, with a bypass channel. The gas pressure ranged from 0.21 to 0.62 Torr and the current density from 150 to 350 a/cm^2. The results show that the width of the Ar II line increases with increasing current density. The width $\delta\lambda_{11}$ of the line

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radiated transverse to the channel exceeds the width $\delta\lambda_{\perp\!\!\!\perp}$ of the line radiated along the discharge by a factor ~1.5- 2. From the values of $\delta\lambda_{\perp\!\!\!\perp}$ the authors determined the "effective temperature" of the ions transverse to the discharge and the electron temperature T_e. T_e increases from 5×10^4 to 9×10^4 (for $p_{Ar} = 0.37$ Torr) when the current density rises from 150 to 350 a/cm^2, and is expected to reach 13×10^4K at j = 550 a/cm^2. It follows from the results that the increase of the intensity of the spontaneous radiation of the Ar II lines and the increase of the power of the coherent radiation of the laser with increasing current density in the capillary are due primarily to the increase in the electron temperature. The electric-conductivity cross sections (Q_a) calculated from the electron temperature are equal to 8×10^{-16} cm^2 at 5×10^4K and 6×10^{-16} cm^2 at 9×10^4K. The electron density N_e is also calculated from the temperature and agrees with the values experimentally determined from the half-width of the hydrogen line H_β. It is concluded that the investigations have yielded the basic characteristics of the discharge used for the argon ionic laser, which are of undisputed interest for the explanation of the mechanism that ensures population inversion. Although the increase of T_e with current density is not subject to doubt, the absolute values of the temperature must be verified by other independent methods. The authors thank A. A. Rukhadze for valuable discussions and advice. Orig. art. has: 1 figure, 2 formulas, and 1 table.

SUB CODE: 20/ SUBM DATE: 17Jun66/ ORIG REF: 004

ACC NR: AP7005582 SOURCE CODE: UR/0020/67/172/002/0317/0319

AUTHOR: Kitayeva, V. F.; Osipov, Yu. I.; Sobolev, N. N.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Adademii nauk SSSR)

TITLE: Spectroscopic investigation of gas discharge for argon ion lasers

SOURCE: AN SSSR. Doklady, v. 172, no. 2, 1967, 317-319

TOPIC TAGS: population inversion, argon ion laser, gas discharge, DISCHARGE TUBE, GAS DISCHARGE SPECTROSCOPY, ION TEMPERATURE

ABSTRACT: Two types of discharge tubes were used in the investigation: 1) tubes 1—3 mm wide, with capillaries approximately 300 mm long between the bulbs, for use with cw lasers, and 2) tubes 5 mm wide and 95 cm long with hot electrodes, for use with pulsed lasers. For tubes of the first type, the temperatures of the Ar ions and neutral atoms were derived from the measured width of their respective spectral lines; the ion concentrations were derived from the Stark effect exhibited by the H_β line of the hydrogen traces. The current densities were about 300 amp·cm^{-2}; ion concentrations, about 3.5 (10^{13}) cm^{-3}; atom temperatures, about 2500°K (rising with current density); and ion temperatures, about 2.5 times greater than the

Card 1/2 UDC: 535.89

ACC NR: AP7005582

atom temperatures. For tubes of the second type, an He-Ar (10:1) mixture was used. Current was applied in 4-μsec, 6—10-kv pulses, yielding a density of approximately 500 amp·cm^{-2}. The atom temperatures and ion concentrations were obtained by comparing the widths of the H_α and H_β lines and by using an assumed ratio for the contribution of the Stark and Doppler effects. Temperatures from 2000 to 6000°K and concentrations from 0.8 to 20 (10^{13}) cm^{-3} were obtained. Electron temperatures, which are required for population inversion, were extremely difficult to determine in the investigated case. Orig. art. has: 1 figure and 2 tables. [JM]

SUB CODE: 20/ SUBM DATE: 22Mar66/ ORIG REF: 001/ OTH REF: 001/
ATD PRESS: 5116

Card 2/2

CHUPAKHIN, O.N.; PUSHKAREVA, Z.V.; KOKOSHKO, Z. Yu.; KITAYKVA, V.G.

Reaction and derivatives of quinaldine. Part 5: Dehydration of 2-quinolylpropanediol. Zhur. ob. khim. 34 no.11:3783-3785 N '64 (MIRA 18:1)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.

ACCESSION NR: AR4023354 S/0299/64/000/004/M017/M018

SOURCE: RZh. Biologiya, Abs. 4M124

AUTHOR: Kitayeva, V. I.

TITLE: Dermatoplasty of ulcers following radiation therapy

CITED SOURCE: Sb. Materialy*obl. nauchno-prakt. konferentsii po onkol. Vy*p 2. Ivanovo, 1963, 133-134

TOPIC TAGS: plastic surgery, ulcer dermatoplasty, radiation therapy, bone ulcer, skin graft acceptance, radiation ulcer, radiation burn

TRANSLATION: The author describes two cases in which skin grafts from the thigh area were used to cover a 3x3 cm ulcer in the sacral region and a 2.5x1.5 cm ulcer in the temporal bone region. After excision of the ulcer in the latter case, the skin flap was removed together with the periosteum. It was established that the use of plastic surgery in treatment of chronic ulcers provides positive results. Periosteal defects do not prevent an acceptance of the skin graft. N.S.

DATE ACQ: 16Mar64 SUB CODE: AM ENCL: 00

Card 1/1

GORSKAYA, A.I.; BOLOTSKAYA, O.P.; KITAYEVA, V.N.

Characteristics of organic matter from deposits of the ancient Yoldian Sea. Trudy VNIGRI no.174:61-87 '61. (MIRA 1[illegible])
(Udov District--Clay)
(Bitumen)

BOL'SHAKOV, Anatoliy Stepanovich; SARIN, Valeriy Ivanovich; SHVAYNSHTEYN, Boris Simonovich; PONOMAREV, V.S., inzh., retsenzent; ZAZOVSKIY, D.G., inzh., retsenzent; MAKAROV, M.S., inzh., retsenzent; POPOV, G.V., inzh., retsenzent; KURBATOV, A.I., retsenzent; KITAYEVA, Z.A., inzh., retsenzent; SDOBNIKOV, Ye.P., retsenzent; KOVALEV, A.K., inzh., retsenzent; KESAREV, A.P., inzh., retsenzent; KISELEVA, N.P., inzh., red.; GROMOV, S.A., kand. tekhn. nauk, red.; SHCHEGLOVACHEVICH, G.S., inzh., red.; USENKO, L.A., tekhn. red.

[Shunting diesel locomotives]Manevrovye teplovozy. Moskva, 1962. 383 p. (MIRA 15:6)
(Diesel locomotives)

KITAYNVICH, Boris Yefimovich; TREGUBOVA, T.A., spetsred.; FRIEDMAN, Z.S., red.izd-va; KOZLYAKOVA, O.I., tekhn.red.

[Radio traffic] Radioobmen. Leningrad, Izd-vo "Morskoi transport," 1959. 194 p. (MIRA 12:12)
(Radio in navigation)

SINITSYN, Mikhail Timofeyevich; KITAYEVICH, B.Ye., red.; SEMENOVA, S.A., red.izd-va; LAVRENOVA, M.B., tekhn.red.

[Radio communications at sea] Ekspluatatsiia radiosviazi na morskom flote. Izd.2., perer. i dop. Moskva, Izd-vo "Morskoi transport," 1959. 308 p. (MIRA 12:11)
(Radio--Installation on ships) (Radio in navigation)

KOVAL'CHUK, Viktor Semenovich. Prinimal uchastiye KITAYEVICH, B.Ye., prepodavatel'; BORODIN, N.I., kand. tekhn. nauk, dotsent, retsenzent; REVUT, D.B., inzh., retsenzent; CHERNANOV, V.V., inzh., retsenzent; TRUBAKOV, A.A., inzh., spets. red.; FRISHMAN, Z.S., red. izd-va; KOTLYAKOVA, O.I., tekhn. red.

[Fundamentals of radio engineering] Osnovy radiotekhniki. Leningrad, Izd-vo "Morskoi transport," 1961. 279 p. (MIRA 14:10)
(Radio) (Radio in navigation)

KITAYEVICH, Boris Yefimovich; FRISHMAN, Z.S., red. izd-va; KOTLYAKOVA, O.I., tekhn. red.

[Radio communications] Radioobmen. Izd.2., ispr. i dop. Leningrad, Izd-vo "Morskoi transport," 1962. 220 p. (MIRA 15:7)
(Radio in navigation)

KITAYEVICH, I.Ye., starshiy prepodavatel'

Relative disposition of two planes. Trudy MIMESKH 4 no.1:123-128 '59.
(MIRA 13:10)
(Geometry, Projective)

KITAYEVICH, Kh.Sh.

New method for cutting fringes. Tekst. prom. 23 no.10:74-75 O '63. (MIRA 17:1)

1. Pomoshchnik mastera galantereynogo tsekha trikotazhnoy fabriki "Viliya" Litovskogo soveta narodnogo khozyaystva.

DMITRIYEV, A.I., doktor veterinarnykh nauk; KITAYEVICH, Ye.I., veterinarnyy vrach.

Etiology of bronchial pneumonia in swine after plague inoculation by crystal violet vaccine. Veterinariia 33 no.3:51-52 Mr '56. (MLRA 9:5)

1. Leningradskiy sel'skokhozyaystvennyy institut.
(PNEUMONIA) (HEMORRHAGIC SEPTICEMIA)

84096

S/058/60/000/006/003/040
A005/A001

26.2340

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 6, p. 29, # 13140

AUTHORS: Sinel'nikov, K.D., Zeydlits, P.M., Grishayev, I.A., Kitayevskiy, L.Kh., Akhiyezer, A.I., Faynberg, Ya.B., Selivanov, N.P., Khizhnyak, N.A.

TITLE: An Electron Accelerator With 3.5 Mev Output Energy

PERIODICAL: Tr. Sessii AN UkrSSR po mirn. ispol'zobaniyu atomn. energii. Kiyev, AN UkrSSR, 1958, pp. 16-23

TEXT: The authors describe a linear electron accelerator with a travelling wave of 3.5 Mev energy. A waveguide loaded with disks is used as accelerating system. The necessary law of wave phase velocity variation is brought about by variation of the diameter of the apertures in the disks. The 280-cm long waveguide is divided into three sections. In the first section, the phase velocity is varied from 0.5 to 0.97 c; in the second and third section it is equal to 0.98 and 0.99 c respectively. The electron equilibrium phase increases during the acceleration process; its initial value is equal to 45° and is chosen according to the optimum capture condition. The computational value of the h.f. power at the

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S/058/60/000/006/003/040
A005/A001

An Electron Accelerator With 3.5 Mev Output Energy

accelerator input is 900 kw; the accelerator field intensity amounts hereat to 16.5 kv/cm. The accelerator output power (about 600 kw) is absorved in a steel load with water cooling; approximately 300 kw are dissipated in the waveguide walls. An additional axisymmetrical magnetic field with an intensity up to 400 Gs is developed by solenoids for focusing the electrons along the waveguide axis. An electron gun with three electrodes serves as electron source; it operates pulsing synchronously with the magnetron generator and provides for a beam of 5-6 mm diameter at the accelerator input. The output parameters of the accelerator measured are: the current is about 20-30 ma in the pulse of 2 μsec duration, the average current is about 20-30 μ a; the beam diameter is 3-4 mm with the divergence angle of 7.10^{-4} - 3.10^{-3} radian; the energy beam half-width is about 8%.

ASSOCIATION: Fiz.-tekhn. in-t AN UkrSSR (Physico-Engineering Institute of the Ukrainian Academy of Sciences)

A.P. Fateyev

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

S/058/63/000/001/015/120
A062/A101

24.6730

AUTHORS: Sinel'nikov, K. D., Grishayev, I. A., Grizhko, V. M., Fisun, A. N., Zykov, A. I., Kitayevskiy, L. Kh.

TITLE: A 30 MeV energy linear travelling-wave electron accelerator

PERIODICAL: Referativnyy zhurnal, Fizika, no. 1, 1963, 39 - 40, abstract 1A374 (In collection: "Elektron. uskoriteli." Tomsk, Tomskiy un-t, 1961, 3 - 9)

TEXT: The authors describe a 30 MeV linear electron accelerator designed at the Physico-technical Institute of the Academy of Sciences of the Ukrainian SSR. The accelerator consists of two sections connected with each other - the injector section and the main section (with a constant wave phase speed); the length of the main section is 2.8 m, the value ka = 2.48 (k - wave vector, a - - waveguide radius). The two sections are energized by one klystron power amplifier, excited by a magnetron generator. The power dissipated in the main section and in the output load is ~10 Mw (in the load 3.3 Mw); the field intensity is then 150 kV/cm. The accelerating system is composed of separate resonators; the

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VERZHIKOVSKIY, Anatoliy Pavlovich; GABIS, Nikolay Vladimirovich; KITAYEV, Nikolay Mikhaylovich; TYNYANKIN, Ivan Ignat'yevich; KHORBENKO, I.G., kapitan 2 ranga, red.; KUZ'MIN, I.F., tekhn. red.

[Concise dictionary on radio electronics] Kratkii slovar' po radioelektronike. Moskva, Voenizdat, 1964. 255 p.
(MIRA 17:2)

KITAYEVICH, A.Ye.; TOLCHINSKIY, V.A.

Case of spinal meningitis of otogenous origin. Zhur. ush., nos. i gorl. bol. 23 no.5:86-87 S-O'63 (MIRA 17:3)

1. Iz otorinolaringologicheskogo otdeleniya (zav. - Ya.V. Bogatyrev) Donetskoy tsentral'noy klinicheskoy bol'nitsy.

KITAYEVICH, A.Ye.

Incidence of acute and chronic otitis media among the population of Makeyevka. Zhur.ush., nos. i gorl. bol. 24 no.5:14-17 S-O '64. (MIRA 18:3)

1. Iz otorinolaringologicheskogo otdeleniya Gorodskoy bol'nitsy No.37 Donetska (glavnyy vrach - Z.O.Moreynis).

KITAYGORA, T. A.

COUNTRY : USSR
CATEGORY : Plant Physiology. Water Conditions.

ABS. JOUR. : RZhBiol., No. 3 1959, No. 10615

AUTHOR : Dvoretskaya, Ye. I., Makarova, N. I., Kitaygora, T. A.
INST. : Academy of Sciences USSR
TITLE : On the Characteristics of Water Metabolism and Drought Resistance in Some Tree and Shrub Species.

ORIG. PUB. : V sb.: Pamyati akad. N. A. Maksimova., M., Izd-vo, 1957, 42-54

ABSTRACT : In the conditions of a moister climate in the forest steppe zone of Ukraine, the intensity of transpiration was higher and osmotic pressure lower than in the same woody plants in the arid conditions of Stalingrad oblast'. Black locust had the greatest heat tolerance; common ash and Pennsylvania ash - the lowest. The greatest water holding ability was observed in the leaves of horvey maple and common ash; the smallest - in the leaves of

CARD: 1/2

15

KITAYGORODSKAYA, O.D., professor; KUSTAREVA, K.S., nauchnyy sotrudnik; TALANOVA, I.K., nauchnyy sotrudnik

Ultraviolet rays in complex therapy of acute rheumatism in children. Pediatriia no.5:44-50 S-O '54. (MLRA 7:12)

1. Iz detskogo otdeleniya (zav. prof. O.D.Kitaygorodskaya) Nauchno-issledovatel'skogo instituta fizioterapii (dir. prof. A.N.Obrosov)

(RHEUMATIC FEVER, in infant and child, ther., ultraviolet rays)
(ULTRAVIOLET RAYS, therapeutic use, rheum. fever in child.)

KITAYGORODSKAYA, O.D., professor (Moskva)

Constipation in children. Fel'd. i akush. 21 no.12:8-12 D '56.
(CONSTIPATION) (MLRA 10:1)
(CHILDREN--CARE AND HYGIENE)

KITAYGORODSKAYA, O.D., professor; KUPER, S.G.; BOSIK, R.N.; GEL'MAN, A.S.; ROZANOVA, A.M.; KHENDEL', A.S.

Use of diathermia in the compound therapy of pneumonia in children. Pediatriia 39 no.1:74-75 Ja-F '56. (MLRA 10:1)

(PNEUMONIA, ther.
diathermy, in child.)
(DIATHERMY, in various dis.
pneumonia in child.)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Role of vitamins in the prevention of diseases in children. Fel'd. i akush. 22 no.10:57-59 O '57. (MIRA 11:1)
(VITAMINS)

KITAYGORODSKAYA, O.D., prof.

It happens in children. Zdorov'e 4 no.1:25-26 Ja '58. (MIRA 11:2)
(DIGESTION) (CHILDREN--NUTRITION)

KITAYGORODSKAYA, O.D., prof.

Attacks of rheumatic fever. Zdorov'e 5 no.3:14-15 Mr '59.
(MIRA 12:3)

(RHEUMATIC FEVER)

KITAYGORODSKAYA, O.D., prof.

Chicken pox. Zdorov'e 5 no.10:18-19 O '59. (MIRA 13:2)
(CHICKEN POX)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Diseases of the kidneys and urinary tract in children. Fel'd. i akush. 24 no.3:15-20 Mr '59. (MIRA 12:4)
(URINARY ORGANS--DISEASES)
(CHILDREN--DISEASES)

KITAYGORODSKAYA, O.D., prof.

Goat's milk. Zdorov'e 7 no. 4:31 Ap '61. (MIRA 14:4)
(GOAT'S MILK)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Pneumonia in children. Fel'd. i akush. 26 no.12:9-15 D '61.
(MIRA 14:12)

(PNEUMONIA)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Exudative diathesis. Fel'd. i akush. 26 no.11:54-56 N '61.
(MIRA 15:2)

(DIATHESIS)

KITAYGORODSKAYA, O.D., prof.

Overheating. Zdorov'e 5 no.8:30 Ag '59. (MIRA 13:8)
(HEATSTROKE)

KITAYGORODSKAYA, O.D., prof.

Rickets. Zdorov'e 6 no.12:14-15 D '60. (MIRA 13:12)
(RICKETS)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Epidemic hepatitis (Botkin's disease) in children. Fel'd. i akush. 25 no.4:26-32 Ap '60. (MIRA 14:5)
(HEPATITIS, INFECTIOUS)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Conditioning of the child. Fel'd. i akush. 25 no.8:34-39 Ag '60.
(MIRA 13:8)

(CHILDREN—CARE AND HYGIENE)

KITAYGORODSKAYA, O.D., prof.; VAYNTSVAYG, G.Ye., red.; LYUDKOVSKAYA, N.I., tekhn. red.

[Digestive disorders in schoolchildren] Rasstroistva pishchevareniia u detei shkol'nogo vozrasta. Moskva, Medgiz, 1961. 87 p. (MIRA 15:2)
(DIGESTIVE ORGANS—DISEASES) (CHILDREN—NUTRITION)

KITAYGORODSKAYA, O.D., prof.

It would seem to be without cause.... Zdorov'e 7 no.11:12-13 N '61. (MIRA 14:11)

(FOOD ALLERGY) (CHILDREN—DISEASES)

KITAYGORODSKAYA, O.D., prof. (Moskva)

Colienteritis in children. Fel'd. i akush. 27 no.8:8-10 Ag '62.
(MIRA 16:8)

(ESCHERICHIA COLI) (ALIMENTARY CANAL—DISEASES)

KITAYGORODSKAYA, Ol'ga Davydovna, prof.; MARTYNSON, A.S., red.

[Manual of children's diseases] Uchebnik detskikh bolezney. Moskva, Medgiz, 1963. 430 p. (MIRA 17:6)

LANDAU, L., akademik, laureat Leninskoy premii; KITAYGORODSKIY, ., pref.

Motion, what is it? Tekh.mol.30 no.11:3-4 '62. (MIRA 16:9)
(Motion)

KITAYGORODSKIY, A. A.

KITAYGORODSKIY, A. A.
Institute of Elemento-Organica Compounds, Moscow

"Some Physical Problems of Organic Crystals."

Paper submitted at
Program of the Conference on the Non-Metallic Solids of Mechanical Properties. Leningrad
May 19 - 26, 1958.

KITAYGORODSKIY, A.B.

Time relay for testing machines. Zav.lab. 28 no.3:368 '62.
(MIRA 15:4)

1. Institut mekhaniki AN USSR.
(Testing machines)

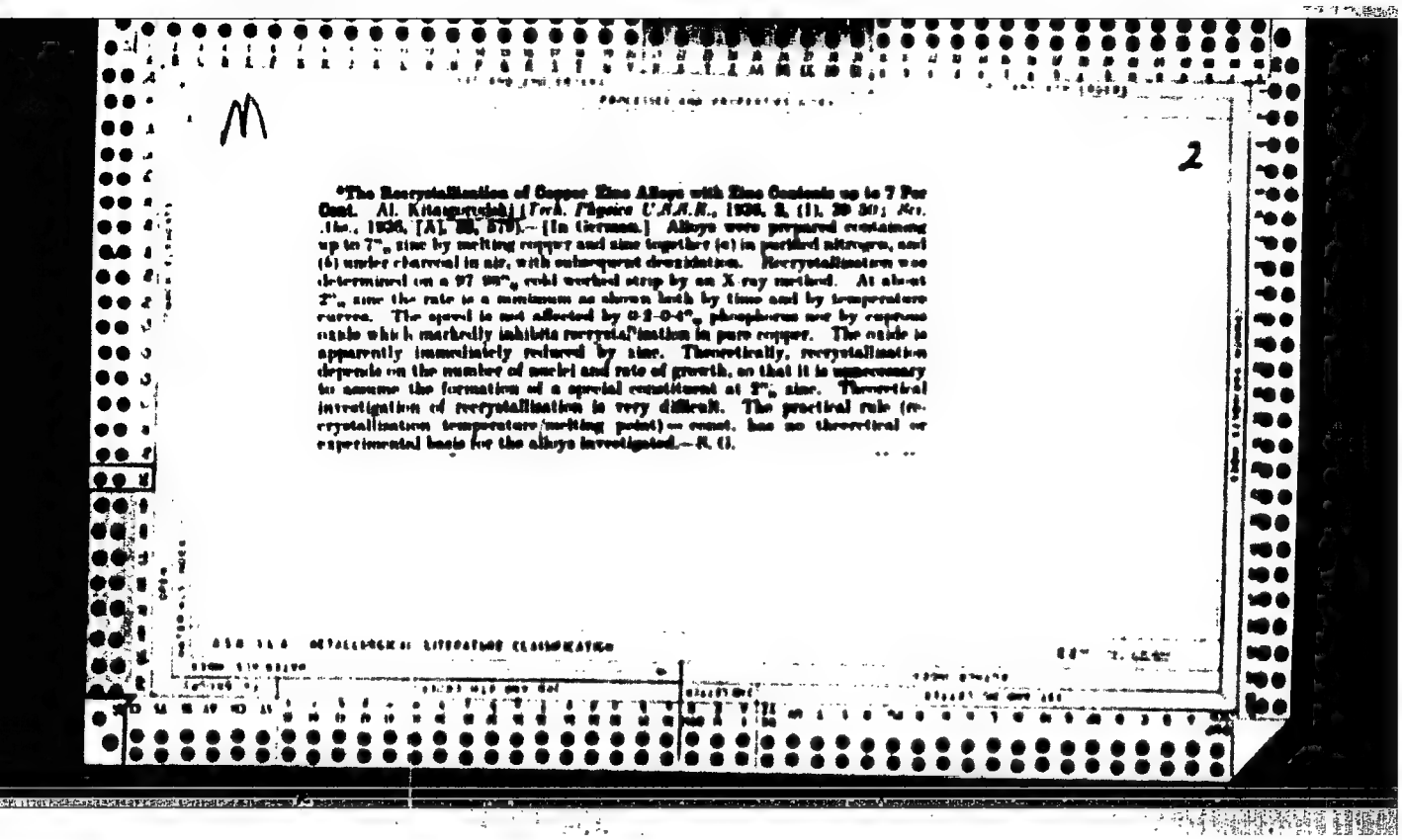
PROCESSES AND PROPERTIES INDEX

646. Structure of Glycine. A. Kitaigorodsky. *Acta Physicochimica*, 5, 5, pp. 749-756, 1936. *In German.*—A new X-ray study of glycine is described. The following data are given for the monoclinic unit cell: a = 5·09, b = 11·9, c = 5·43 Å, β = 111° 38′; space group = $P2_1/n$; 4 mol. of $NH_2 \cdot CH_2 \cdot COOH$ per unit cell. These values agree with those of Hengstenberg and Lenel [see Abstract 2934 (1931)], but the present author disagrees with the molecular arrangement put forward in the earlier work and new atomic coordinates are tabulated. It is pointed out that if the comparison between calculated and observed intensities is restricted to the ($hk0$) and ($0kl$) planes both structures give fair agreement, but when the comparison is extended to include general (hkl) planes only the structure put forward by the present author gives calculated intensities in agreement with those observed. The following interatomic distances are given, C — C = 1·47, C — N = 1·40, C — O = 1·30 Å.

J. L.

VOL. XL.—A.—1937.

METALLURGICAL LITERATURE CLASSIFICATION

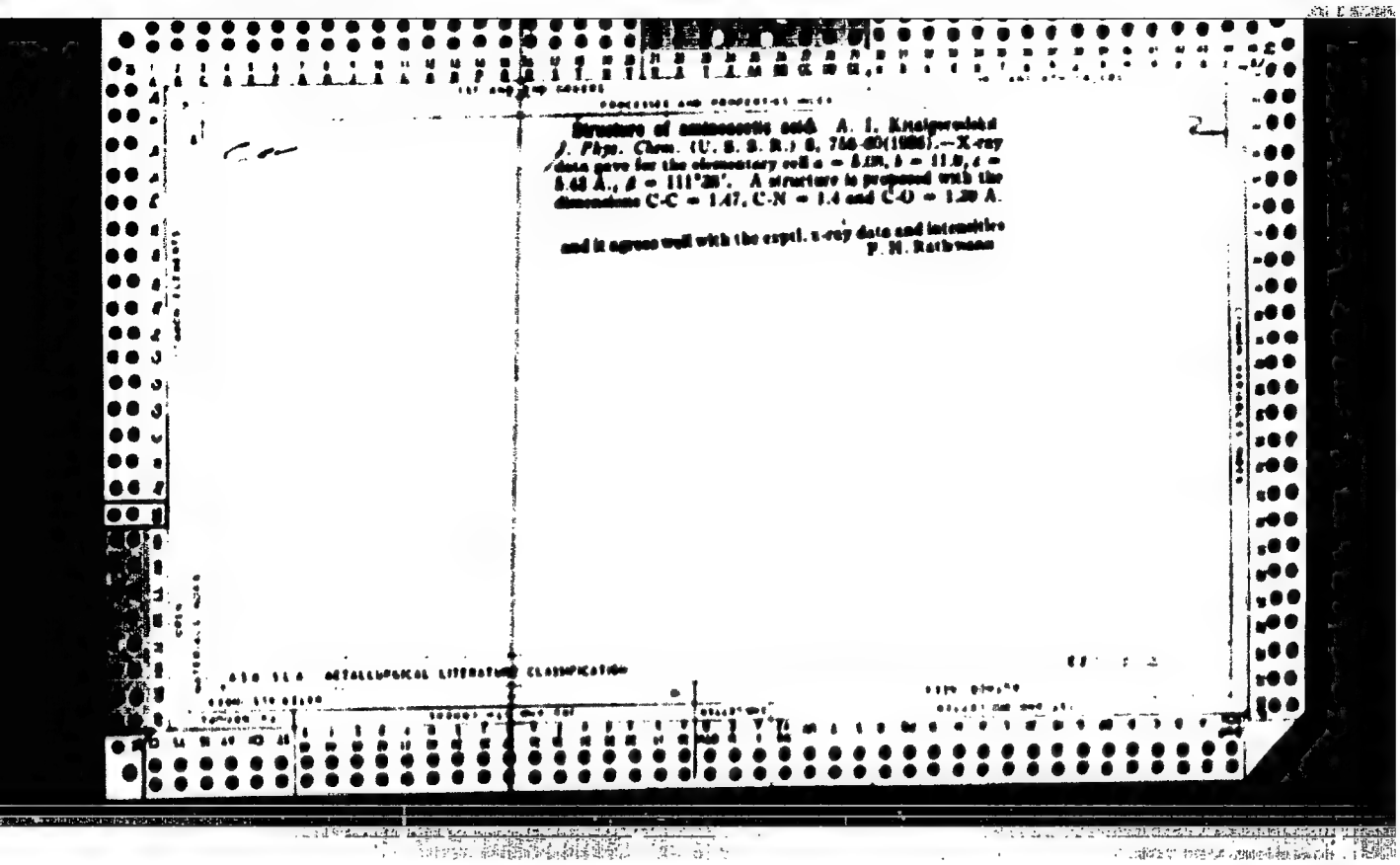


"The Recrystallization of Copper Zinc Alloys with Zinc Contents up to 7 Per Cent. Al. Kitaigorodskii. *Trudy Inst. Fizicheskoi Khimii U.F.A.N.*, 1938, 2, (1), 39-50; *Ref. Zhur.*, 1939, [A], 28, 570).— [In German.] Alloys were prepared containing up to 7% zinc by melting copper and zinc together (a) in purified nitrogen, and (b) under charcoal in air, with subsequent deoxidation. Recrystallization was determined on a 97 per cent. cold worked strip by an X-ray method. At about 2% zinc the rate is a maximum as shown both by time and by temperature curves. The speed is not affected by 0.2-0.4% phosphorus nor by copper oxide which markedly inhibits recrystallization in pure copper. The oxide is apparently immediately reduced by zinc. Theoretically, recrystallization depends on the number of nuclei and rate of growth, so that it is unnecessary to assume the formation of a special constituent at 2% zinc. Theoretical investigation of recrystallization is very difficult. The practical rule (recrystallization temperature (melting point) = const. has no theoretical or experimental basis for the alloys investigated.—R. (.

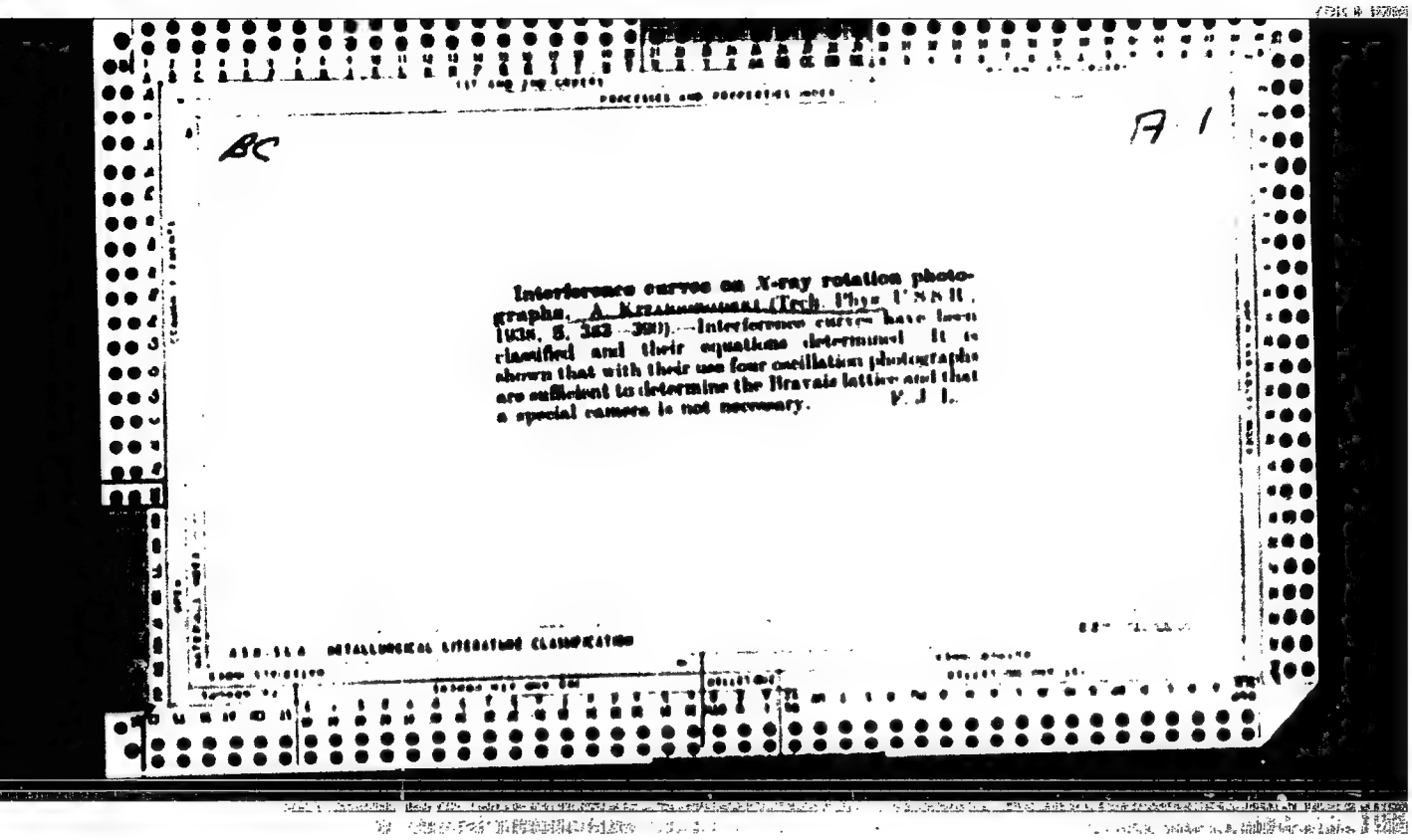
PROCESSES AND PROPERTIES INDEX

"Investigation of the Recrystallization of Copper-Zinc Alloys (with Low Zinc Content). A. I. [illegible] (*Zhurnal Tekhnicheskoy Fiziki* (*J. Tech. Physics*), [illegible], 6, (2) [illegible]).—(In Russian.) By a series of meltings in nitrogen and with a deoxidizer, it was possible to observe separately the effects of zinc and of cuprous oxide on the recrystallization temperature of copper and brass. This temperature for α-brass (with up to 6% zinc) reaches a maximum at 2% zinc. Phosphorus has no effect on the shape of the recrystallization temperature curve, while cuprous oxide has an effect only on that of pure copper, since it is reduced by the zinc present in brass. Experiment and theory indicate that there is no constant ratio between the recrystallization temperature and the melting point.—N. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



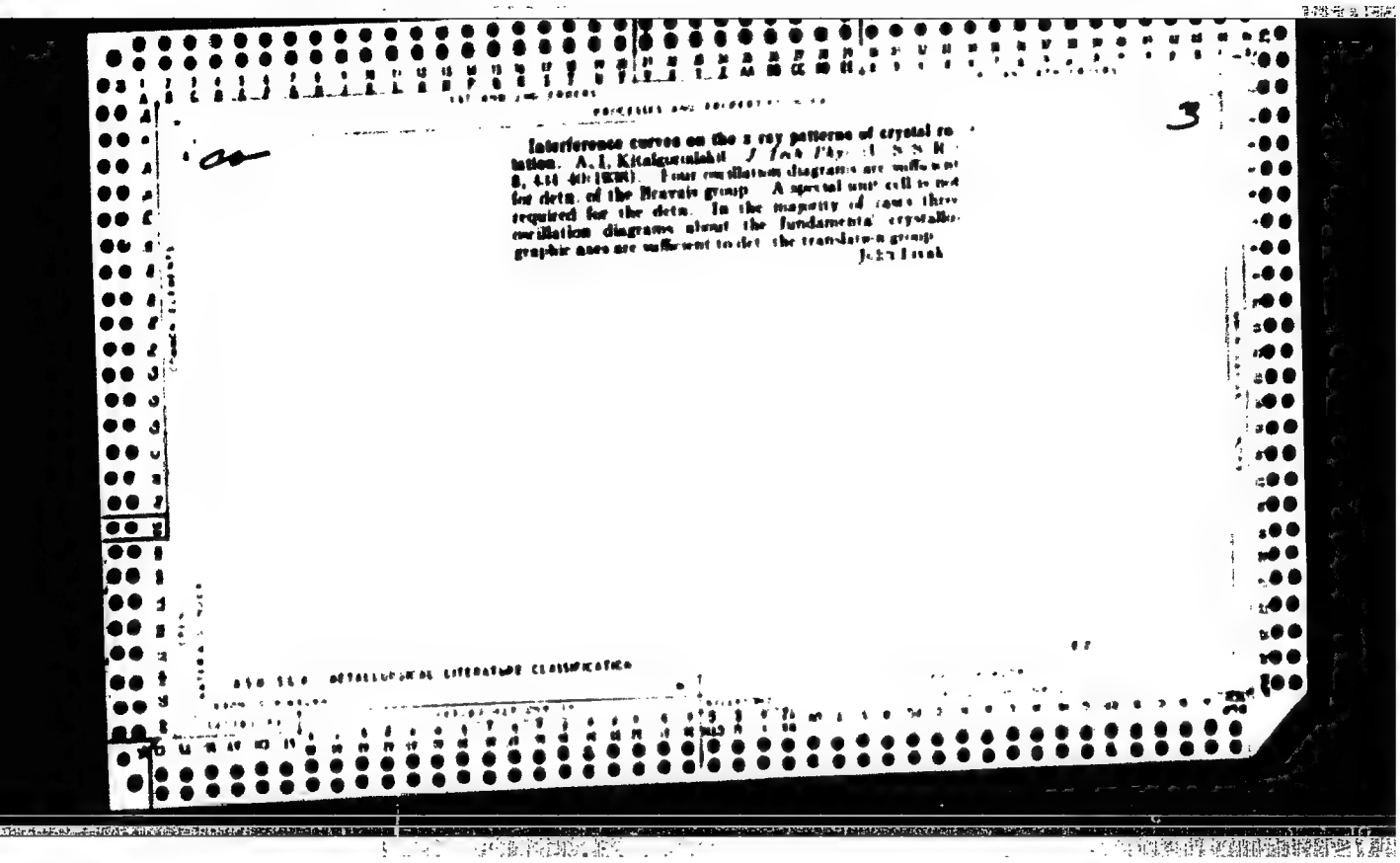
Structure of ammonoacetic acid. A. I. Kitaigorodskii
J. Phys. Chem. (U. S. S. R.) 8, 746-60(1936).—X-ray
data gave for the elementary cell $a = 5.15$, $b = 11.8$, $c =$
5.48 Å., $\beta = 111°20'$. A structure is proposed with the
dimensions C-C = 1.47, C-N = 1.4 and C-O = 1.20 Å.
and it agrees well with the exptl. x-ray data and intensities.
P. H. Ratbmann



BC

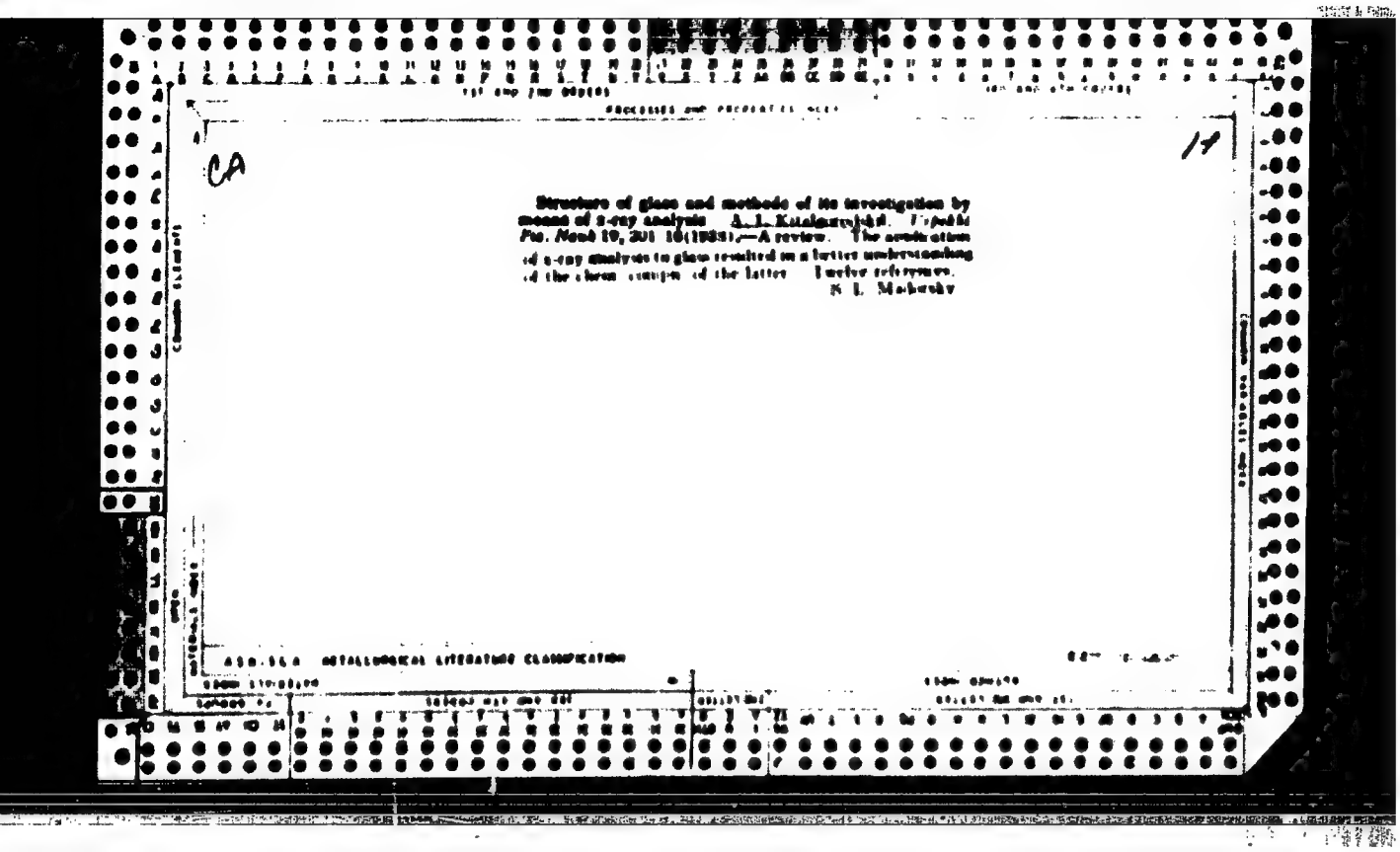
A 1

Interference curves on X-ray rotation photographs. A. Krzhizhanovskaya (Tech. Phys. U.S.S.R., 1938, 5, 383–391).—Interference curves have been classified and their equations determined. It is shown that with their use four oscillation photographs are sufficient to determine the Bravais lattice and that a special camera is not necessary. V. J. I.

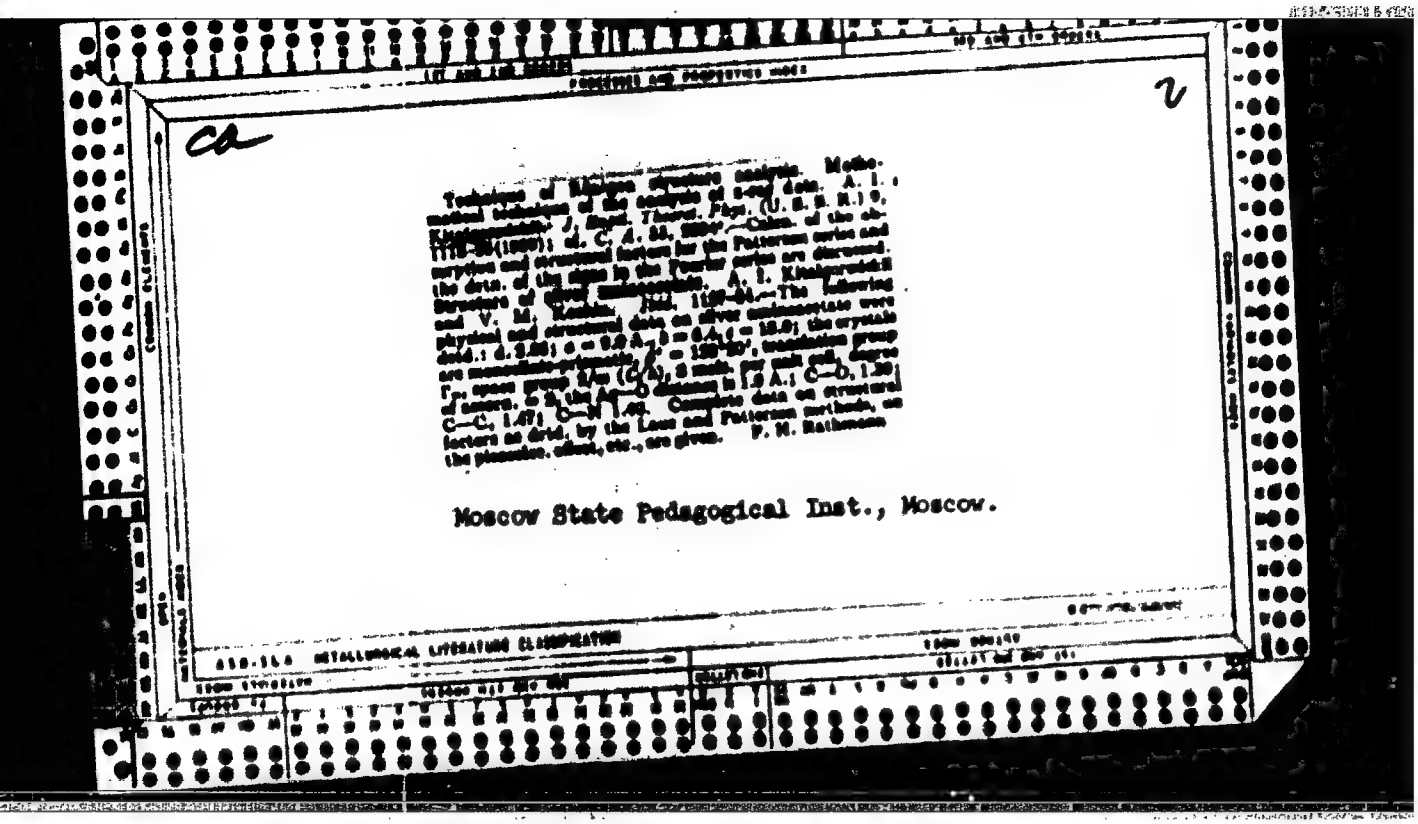


Interference curves on the x ray patterns of crystal rotation. A. I. Kitaigorodskiĭ. *J. Tech. Phys. (U.S.S.R.)* 8, 434-40 (1938). Four oscillation diagrams are sufficient for determ. of the Bravais group. A special unit cell is not required for the determ. In the majority of cases three oscillation diagrams about the fundamental crystallographic axes are sufficient to det. the translation group.

J. S. Lamb



Structure of glass and methods of its investigation by means of x-ray analysis A. I. Kitaigorodskii. Uspekhi Fiz. Nauk 19, 201 10(1938).—A review. The application of x-ray analysis to glass resulted in a better understanding of the atom groups of the latter. Twelve references.
S. L. Mokrushev



Moscow State Pedagogical Inst., Moscow.

KITAYGORODSKIY, A. I.

"Investigation of the Structure of Amino-acetic Silver," Zhur. Eksper. i Teoret Fiz., 9, No. 9, 1939.

Dept. of Photobiology, AU Inst. of Experimental Medicine, Moscow.

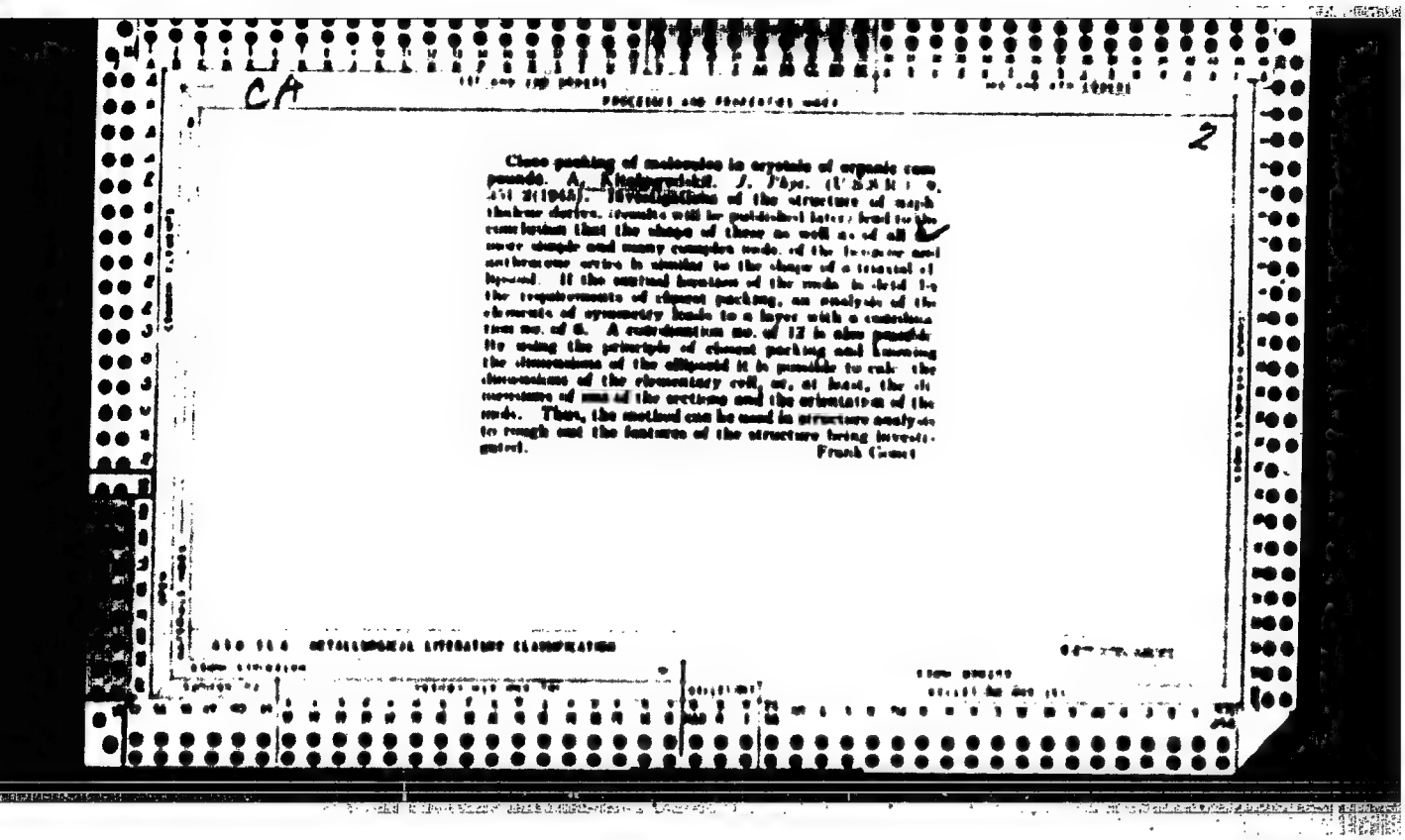
[redacted], A. I., ed.

Reference book on X-ray analysis Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1940.
315 p. (54-54080)

QC481.K53

KITAYGORODSKIY, A. I.

"On Organometallic Compounds of Mercury, 31, X-ray Study of the Structure of $C_2H_2HgCl_2$," Iz. Ak. Nauk SSSR, Otdel. Khim. Nauk, No. 2, 1945.

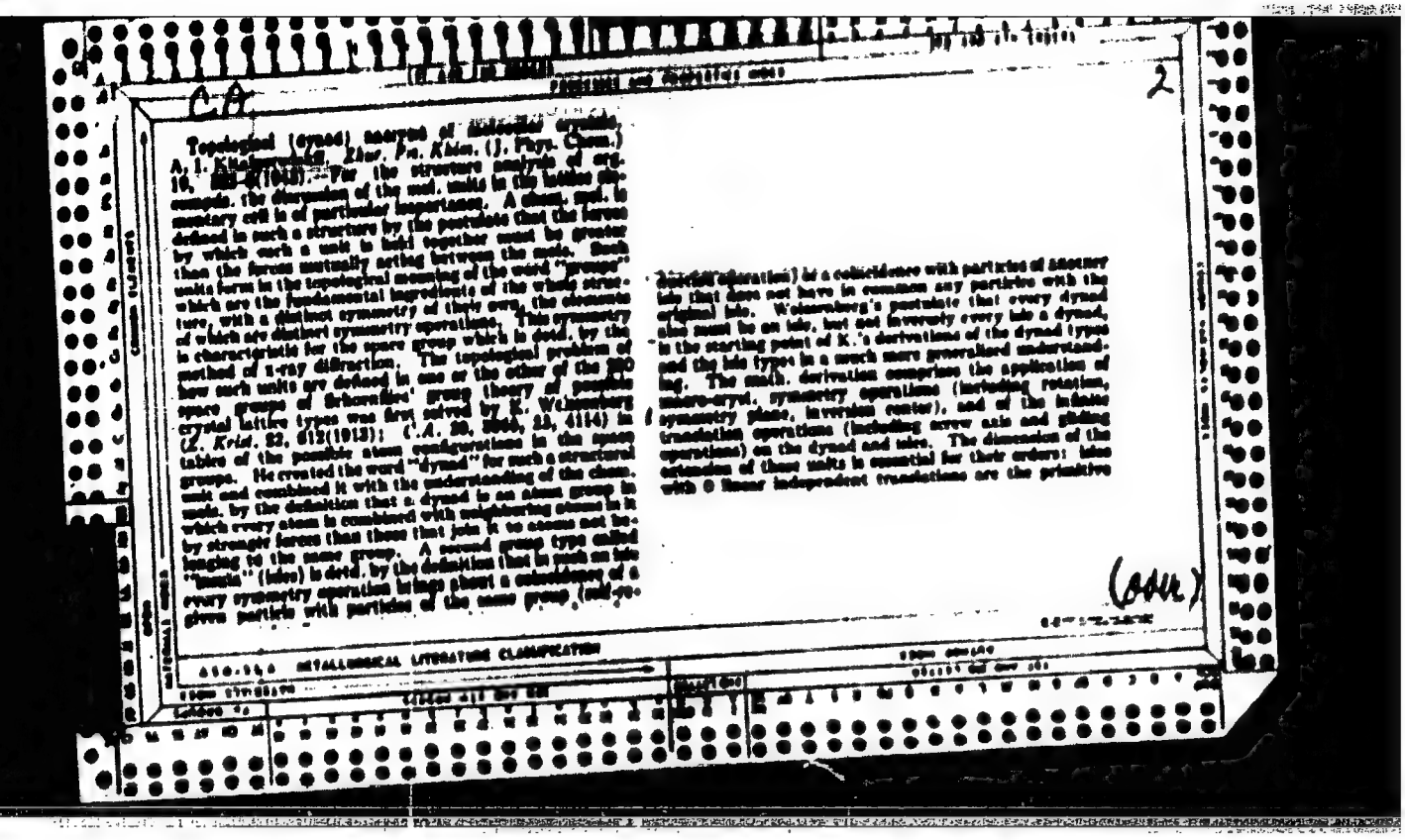


CA

2

Close packing of molecules in crystals of organic compounds. A. Kitaigorodskii. *J. Phys.* (U.S.S.R.) 9, 351 2(1945). Investigations of the structure of naphthalene derivs. (results will be published later) lead to the conclusion that the shape of these as well as of all more simple and many complex mols. of the benzene and anthracene series is similar to the shape of a triaxial ellipsoid. If the central locations of the mols. in crystals fulfil the requirements of closest packing, an analysis of the elements of symmetry leads to a layer with a coordination no. of 6. A coordination no. of 12 is also possible. By using the principle of closest packing and knowing the dimensions of the ellipsoid it is possible to calc. the dimensions of the elementary cell, or, at least, the dimensions of one of the sections and the orientation of the mols. Thus, the method can be used in structure analysis to rough out the features of the structure being investigated.

Frank Gamet



Topological (dyad) aspect of molecular crystals.
A. I. Kitaigorodskii, Zhur. Fiz. Khim. (J. Phys. Chem.) 18, [illegible] (1944).—For the structure analysis of organic compds. the discussion of the mol. units in the lattice elementary cell is of particular importance. A chem. mol. is defined in such a structure by the postulate that the forces by which such a unit is held together must be greater than the forces mutually acting between the mols. Such units form in the topological meaning of the word "groups" which are the fundamental ingredients of the whole structure, with a distinct symmetry of their own, the elements of which are distinct symmetry operations. This symmetry is characteristic for the space group which is found, by the method of x-ray diffraction. The topological problem of how such units are defined in one or the other of the 230 space groups of Schoenflies' group theory of possible crystal lattice types was first solved by K. Weissenberg (Z. Krist. 52, 612(1913); C.A. 20, 2060, 23, 4114) in tables of the possible atom configurations in the space groups. He created the word "dyad" for such a structural unit and combined it with the understanding of the chem. mols. by the definition that a dyad is an atom group in which every atom is combined with neighboring atoms in it by stronger forces than those that join it to atoms not belonging to the same group. A second group type called "mols." (idos) is defd. by the definition that in such an ido every symmetry operation brings about a coincidence of a given particle with particles of the same group (mid-position operation) but a coincidence with particles of another ido that does not have in common any particle with the original ido. Weissenberg's postulate that every dyad also must be an ido, but not inversely every ido a dyad, is the starting point of K.'s derivations of the dyad types and the ido types in a much more generalized understanding. The math. derivation comprises the application of micro-cryst. symmetry operations (including rotation, symmetry plane, inversion center), and of the infinite translation operations (including screw axis and gliding operations) on the dyad and ido. The dimension of the extension of these units is essential for their orders: idos with 0 linear independent translations are the primitive

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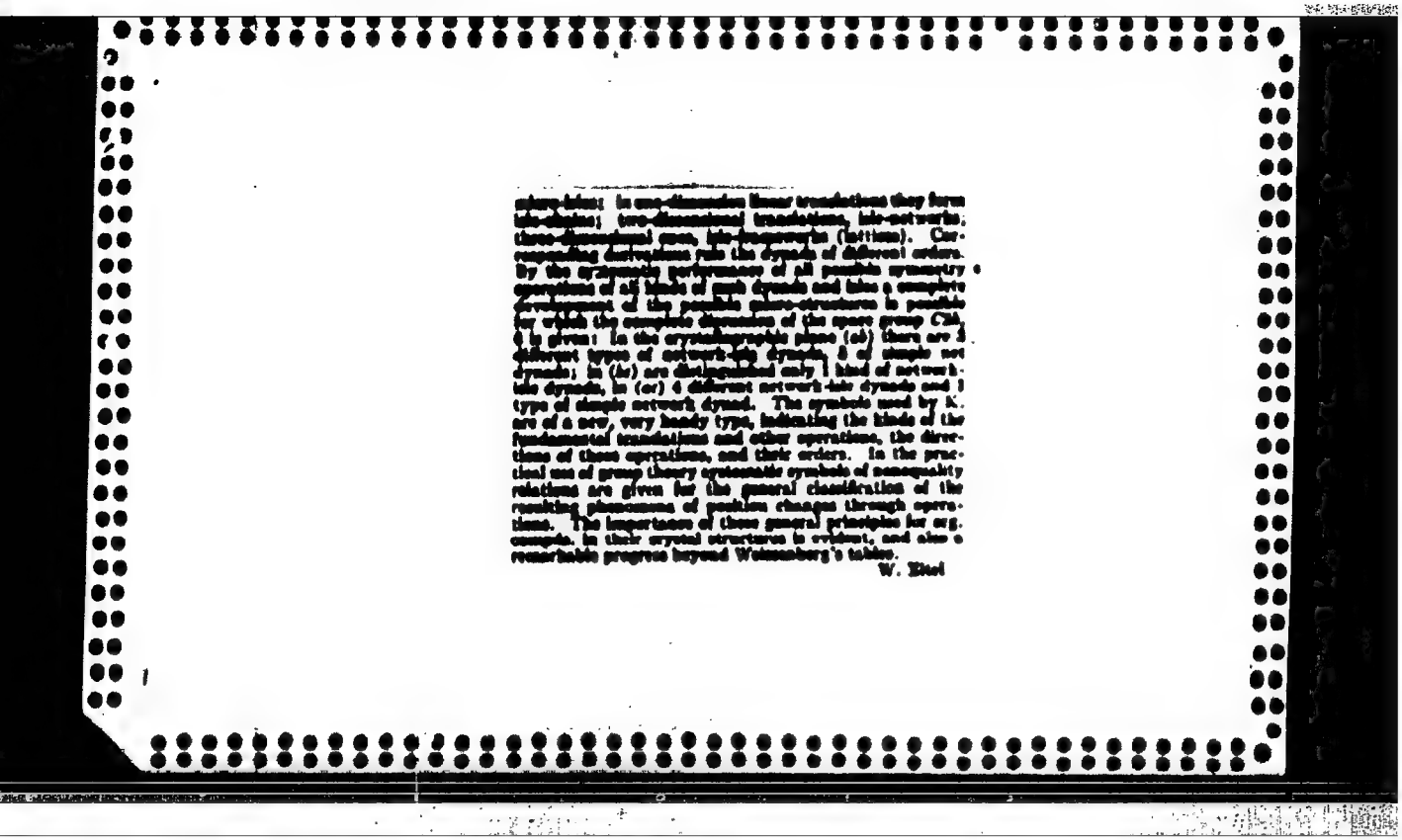


where-idem: in one-dimension linear translations they form isle-chains; (uni-dimensional translations, isle-networks, three-dimensional space, isle-frameworks (lattices). Corresponding derivations rule the dynamic of different orders. By the systematic performance of all possible symmetry operations of all kinds of each dynamic and thus a complete development of the possible space-structures is possible for which the complete discussion of the space group Ch. 4 is given: In the crystallographic plane (ab) there are 5 different types of network-like dynamic, 4 of simple net dynamic; in (bc) are distinguished only 1 kind of network-like dynamic, in (ac) 4 different network-isle dynamic and 1 type of simple network dynamic. The symbols used by K. are of a new, very handy type, indicating the kinds of the fundamental translations and other operations, the directions of these operations, and their orders. In the practical use of group theory systematic symbols of consequality relations are given for the general classification of the resulting phenomena of position changes through operations. The importance of these general principles for org. compds. in their crystal structures is evident, and also a remarkable progress beyond Wehnelberg's tables.

W. Eitel

CA

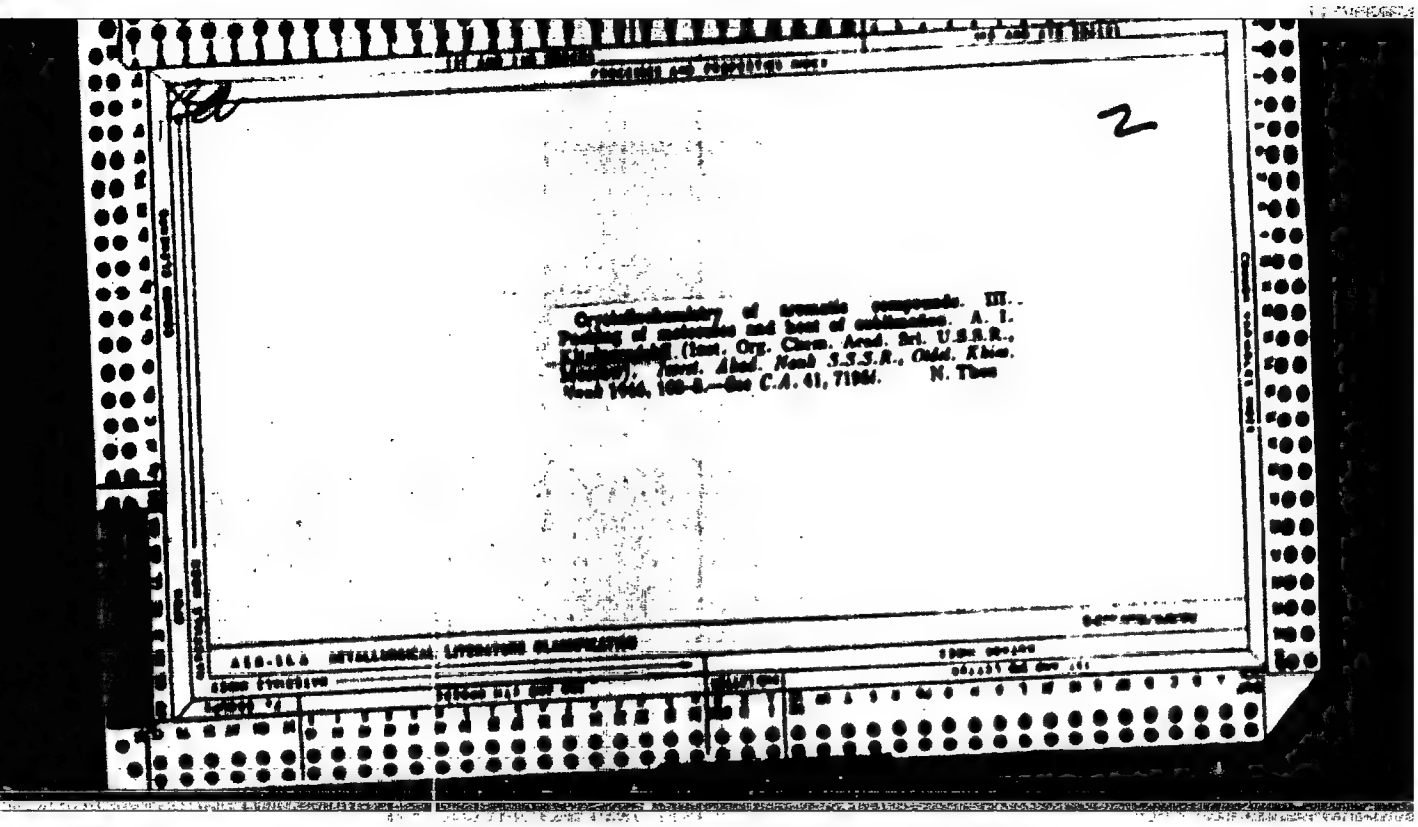
Crystal structure of the naphthylamines. A. I. Kitaigorodskii. *Doklady Akad. Nauk S.S.S.R.* 50, 315-17 (1945).—The 2 detns. exemplify structures governed by the tendency to closest packing and by H-bond forces. (1) β-Naphthylamine is monoclinic, a = 8.6, b = 6.0, c = 16.0 A., angle 110°, no. of mols. per unit cell = 4. Intensities could so far be detd. only for low-index reflections. On that basis, the space group C_{2h}^5 is probable. The structure is evidently closely related to that of $C_{10}H_8$, with c doubled. The positions of the centers of the mols. are the same in both structures; the orientation of the mols. with respect to the axes is somewhat different; specifically, in naphthylamine, the angles of rotation of the short axis of the mol. around the perpendicular to the ab plane, of the long axis around c, and of the long axis around b, are, resp., 22, −10, and 34°. (2) α-Naphthylamine crystallizes in the orthorhombic system with a = 12.00, b = 9.65, and c = 39.3 A., this gives 24 mols. per unit cell. Absence of reflections of the hkl type indicates that the cell is not centered. From rotation patterns around the 3 axes, the only possible space group is $P_{na}(D_{2h})$. The compd. forms in the crystal complexes of 3 mols., and the unit cell consists of 4 "elements" formed by pairs of such complexes, each pair including 6 mols. and possessing a center of symmetry. This peculiar instance of mol. assocn. in the crystal can be linked with the pseudo-hexagonality of the lattice, a pseudohexagonal cell, twice the size of the unit one, with a senary axis parallel to b, being obtained along the axes [001], [201], and [010]. The crystal can be viewed as built up of hexagonal prisms of the length b and radius 6.7 A., each prism contg. 6 mols., i.e. one "element" of the unit cell. Within each element, all 6 mols. are oriented with their long axes parallel; in 3 mols. the NH_2 groups are oriented in one direction, in the 3 others in the opposite direction. There appears to be a tendency for primary amines to assoc. in groups of 3. N. Thon

METALLURGICAL LITERATURE CLASSIFICATION

KITAYGORODSKIY, A. I.

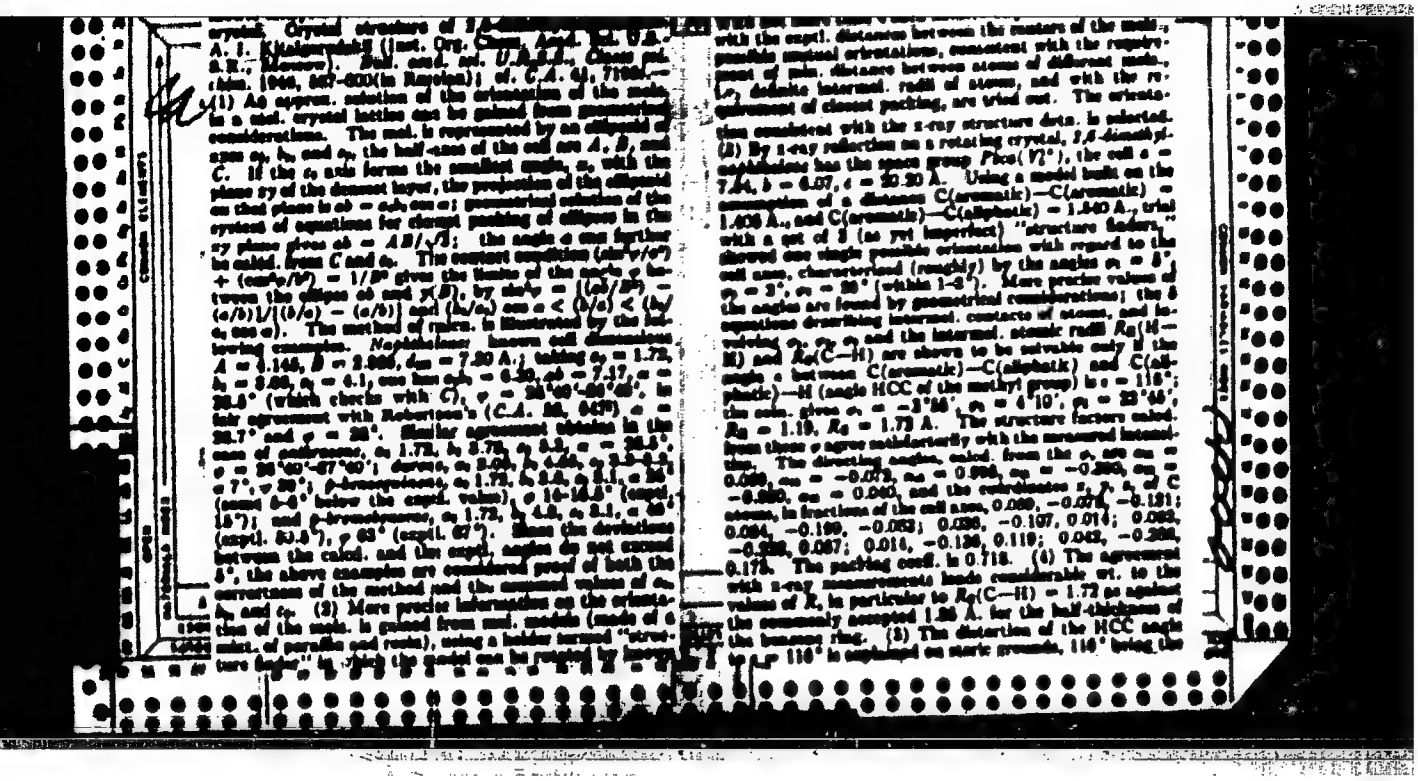
"The Close-Packing of Molecules in Crystals of Organic Compounds," Zhur. Phys. 351, No. 4, Vol 9, 1945.

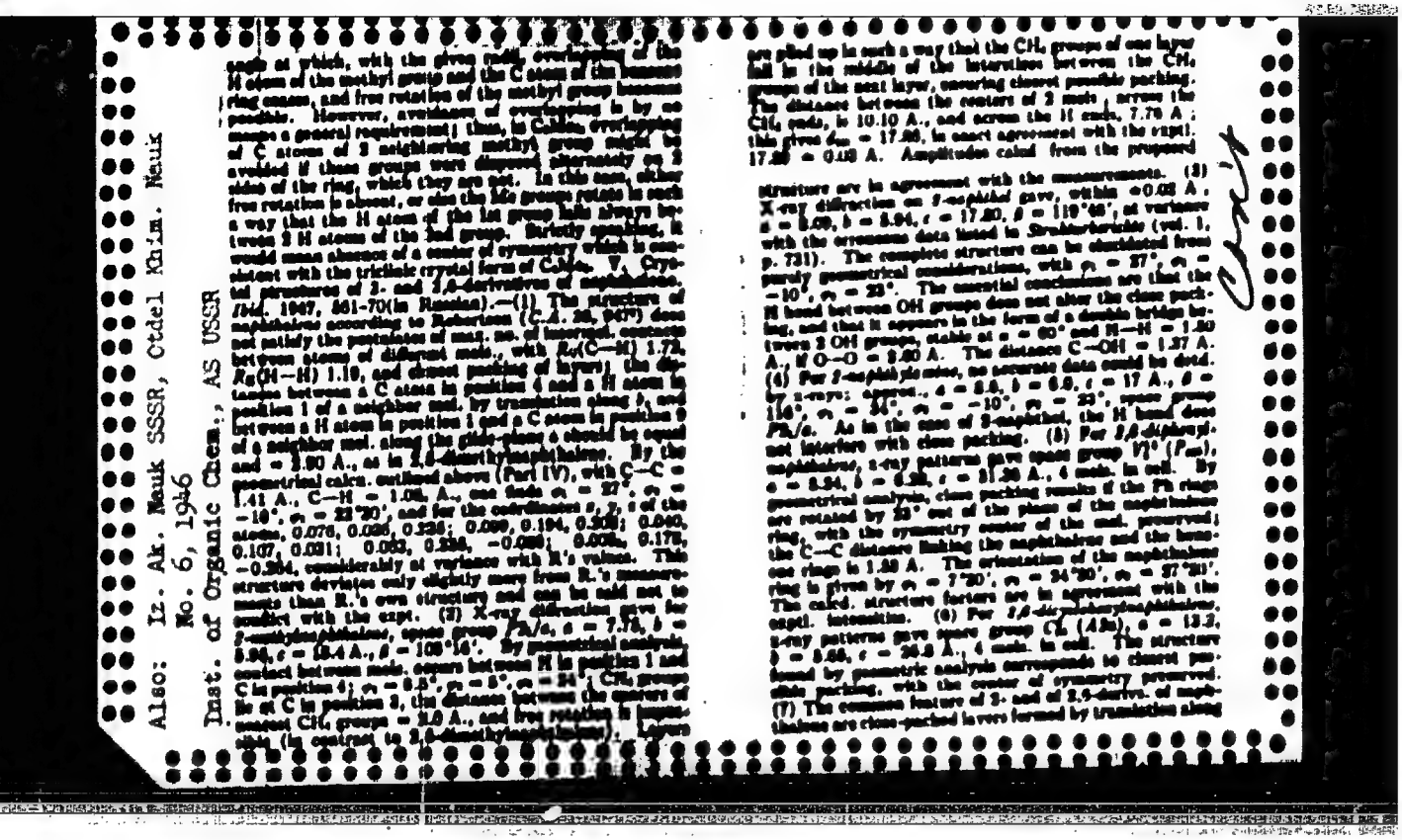
Inst. of Organic Chemistry of the AS USSR

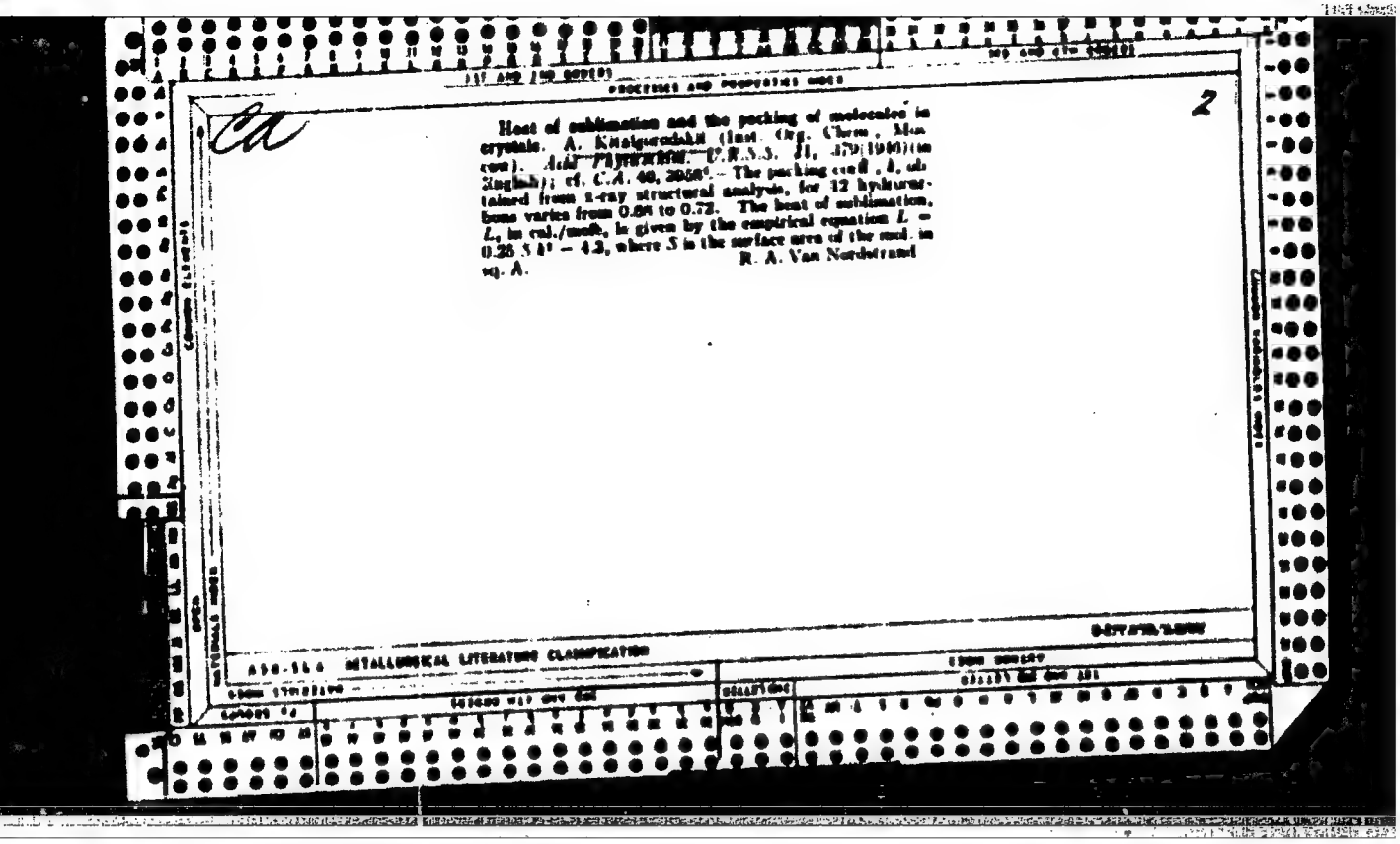


2

Crystallochemistry of aromatic compounds. III. Packing of molecules and heat of sublimation. A. I. Kitaigorodskiĭ. (Inst. Org. Chem. Acad. Sci. U.S.S.R., Moscow). Zhur. Obshch. Khim. U.S.S.R., Oddl. Khim. Nauk 1936, 169-8.—See C.A. 41, 7196d. N. Thon





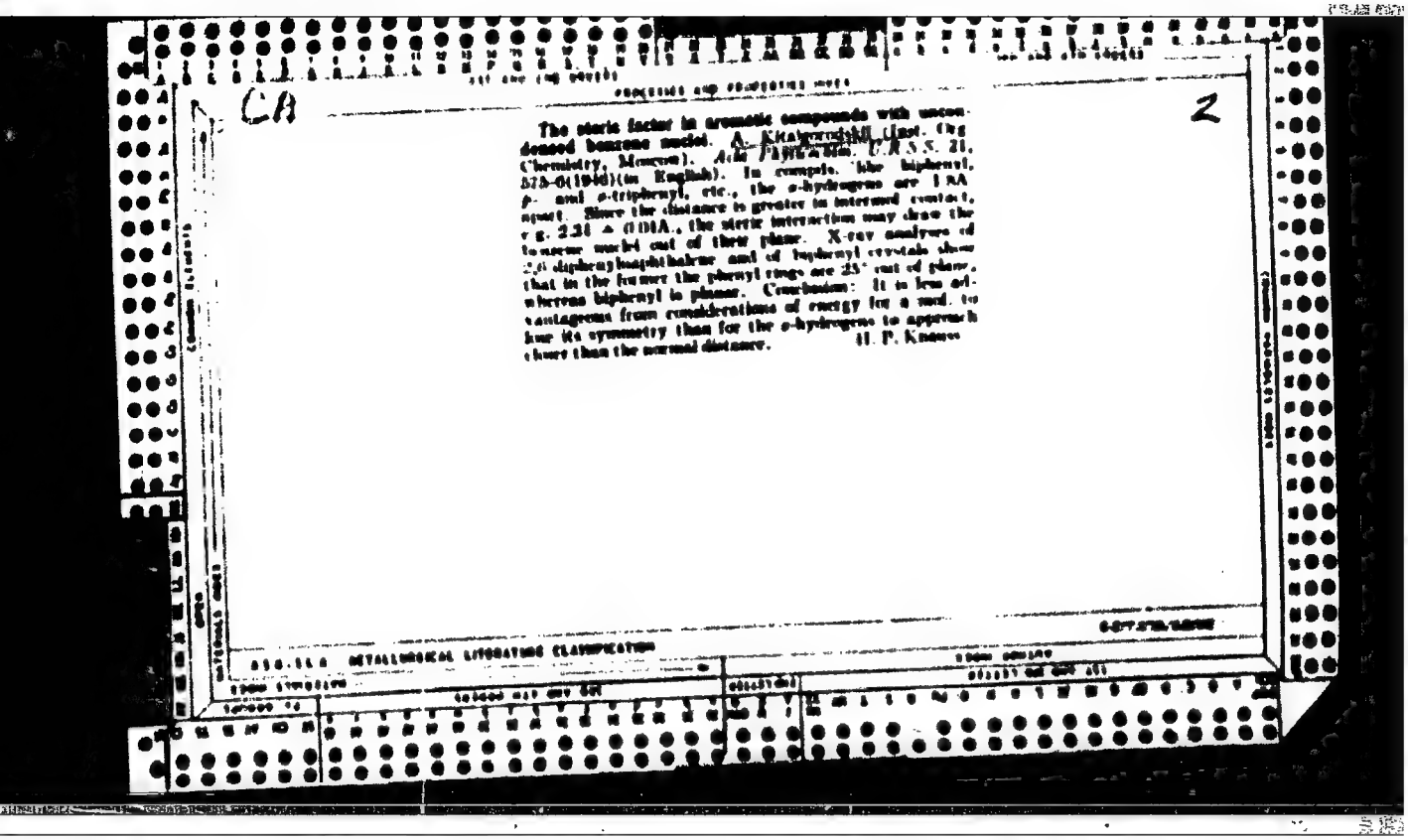


Ca

Heat of sublimation and the packing of molecules in crystals. A. Kitaigorodskiĭ (Inst. Org. Chem., Moscow). *Acta Physicochim. U.R.S.S.* 21, 479(1946)(in English); cf. *C.A.* 40, 2958⁶. — The packing coeff., *k*, obtained from x-ray structural analysis, for 12 hydrocarbons varies from 0.68 to 0.72. The heat of sublimation, L_s in cal./mole, is given by the empirical equation $L_s = 0.25\,S^{1.1} - 4.5$, where S is the surface area of the mol. in sq. A.

R. A. Van Nordstrand

2



CA

2

The steric factor in aromatic compounds with unconjugated benzene nuclei. A. Kharasch and H. P. Knauss (Inst. Org. Chemistry, Moscow). *Acta Physicochim. U.R.S.S.* 21, 573-6(1946)(in English). In compds. like biphenyl, *p*- and *o*-triphenyl, etc., the *o*-hydrogens are 1.84 A. apart. Since the distance is greater in internuclear contact, e.g. 2.34 A. (1.08A., the steric interaction may draw the benzene nuclei out of their plane. X-ray analyses of 2,2'-diphenylnaphthalene and of biphenyl crystals show that in the former the phenyl rings are 25° out of plane, whereas biphenyl is planar. Conclusion: It is less advantageous from considerations of energy for a mol. to lose its symmetry than for the *o*-hydrogens to approach closer than the normal distance. H. P. Knauss

KITAYGORODSKIY, A. FA 52T68

USSR/Physics Jul/Aug 1946
Crystallography
Aromatic Hydrocarbons

"The Structure of Dibromanthracene and the C--C Distance in the Aromatic Hydrocarbons," A. Kitaygorodskiy, Inst Org Chem, Acad Sci USSR, Moscow, 2 pp

"Acta Physicochimica URSS" Vol XXI, No 4 - 767-8

Study of the C--C distance in aromatic hydrocarbons by measurements of a dibromanthracene crystal. One of the C--C distances differs essentially from the mean. Doubt expressed regarding validity of the conclusions drawn in a recent study of the structure of coronene by Robertson and White. Received 26 Apr 1946. [redacted] 52T68

also: Dok. AN, 767, No. 4, Vol. 21, 1946, Acad. of Sciences of the USSR, Inst., Organic Chem., Moscow.

KITAYGORODSKIY, A.

PA 54T94

USSR/Physics
Crystallography
Aromatic Compounds

Sep/Oct 1946

"The Crystal Chemistry of Aromatic Compounds: I, The Packing of Molecules in Crystals of Organic Compounds," A. Kitaygorodskiy, Inst Org Chem, Acad Sci USSR, Moscow, 22 pp

"Acta Physicochimica URSS" Vol XXI, No 5 - pp. 8[illegible]-9[illegible]

Establishes two types of close packing in a layer, the simple oblique-angled, ... the "centered" rectangular packing. On basis of symmetry of closely packed layers, shows space groups in which they may occur. Formulates two rules of organic crystal chemistry,

54T94

USSR/Physics (Contd)

Sep/Oct 1946

checking them against all available experimental data. Discusses distribution in a crystal of centrosymmetric molecules. Received, 16 Aug 1945.

Also: Dok. AN. 899, No. 5, Vol. 21, 1946, AS USSR, Inst. of Organic Chem., Moscow.

54T94

KITAYGORODSKIY, A.

PA 54T51

USSR/Chemistry - Aromatic Compounds Nov/Dec 1946
Chemistry - Crystallography

"The Crystal Chemistry of Aromatic Compounds: II, An Investigation of Two Dioctyl Naphthalenes of Unknown Structure," A. Kitaygorodskiy, Inst Org Chem, Acad Sci USSR, Moscow, 8 pp

"Acta Physicochimica URSS" Vol XXI, No 6

Using method of X-ray analysis, unit cells of the crystals of 2.6-dioctyl naphthalene and di-(2.2.4.4) tetramethyl butyl naphthalene were measured, their space groups determined and intensities of reflections estimated. Structure of molecule of former determined and diagram of structure of molecule and crystal drawn to scale in the paper. Received, 18 May 1945.

54T51

KITAYGORODISKIY, A. I.

PA 15T19

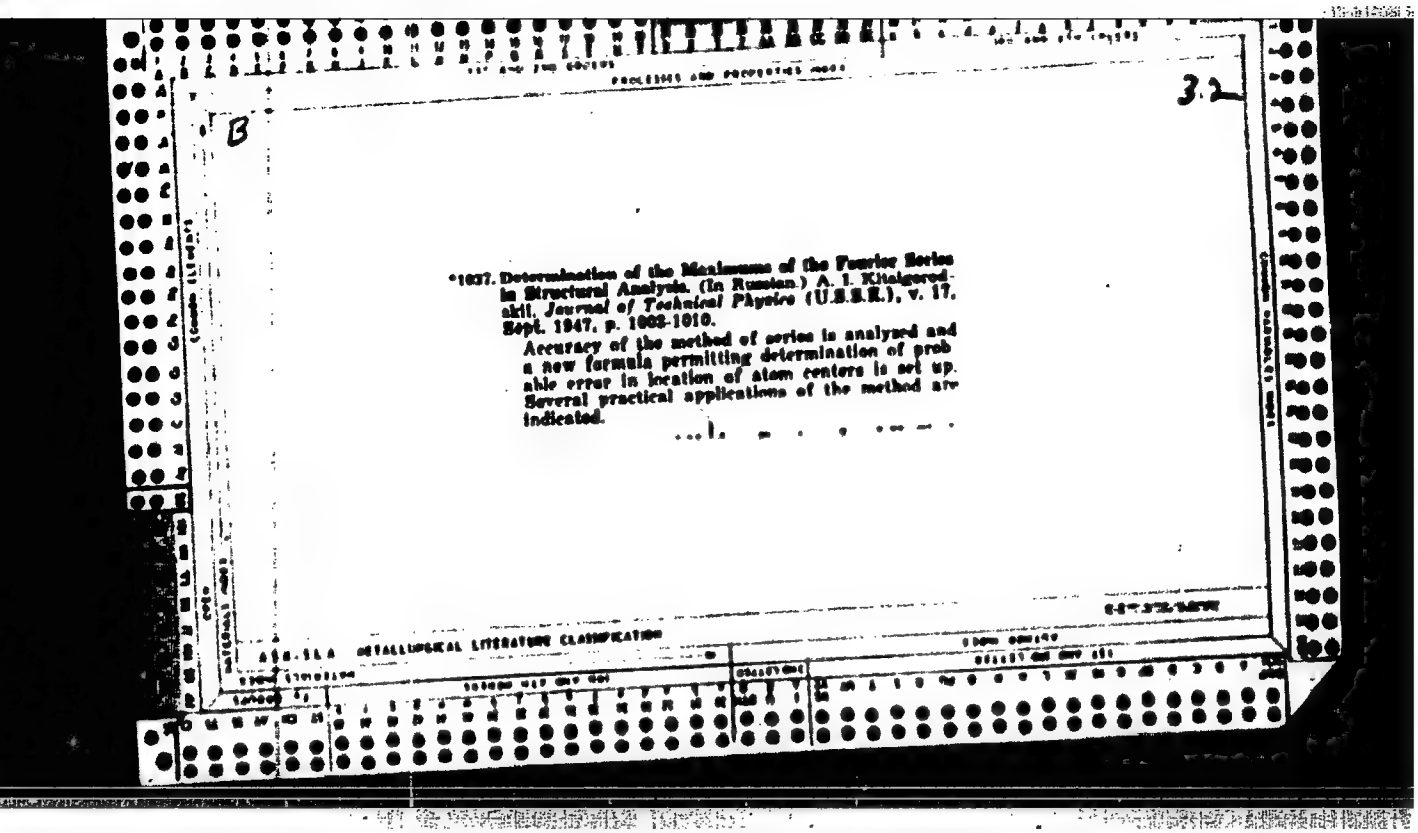
USSR/Chemistry - Mercury Compounds May/Jun 1947
Chemistry - Acetylene

"Organometallic Compounds of Mercury: XXXIV, X-Ray Structural Investigation of C_2H_2 . HgClBr," A. I. Kitaygorodskiy, 6 pp

"Izv Ak Nauk Otd Khim Nauk" No 3

Measurement of the unit cell, determination of the space group, determination of the arrangement of Hg, Cl and Br atoms by the Patterson series, and consideration of the arrangement of light atoms by geometrical analysis.

15T19

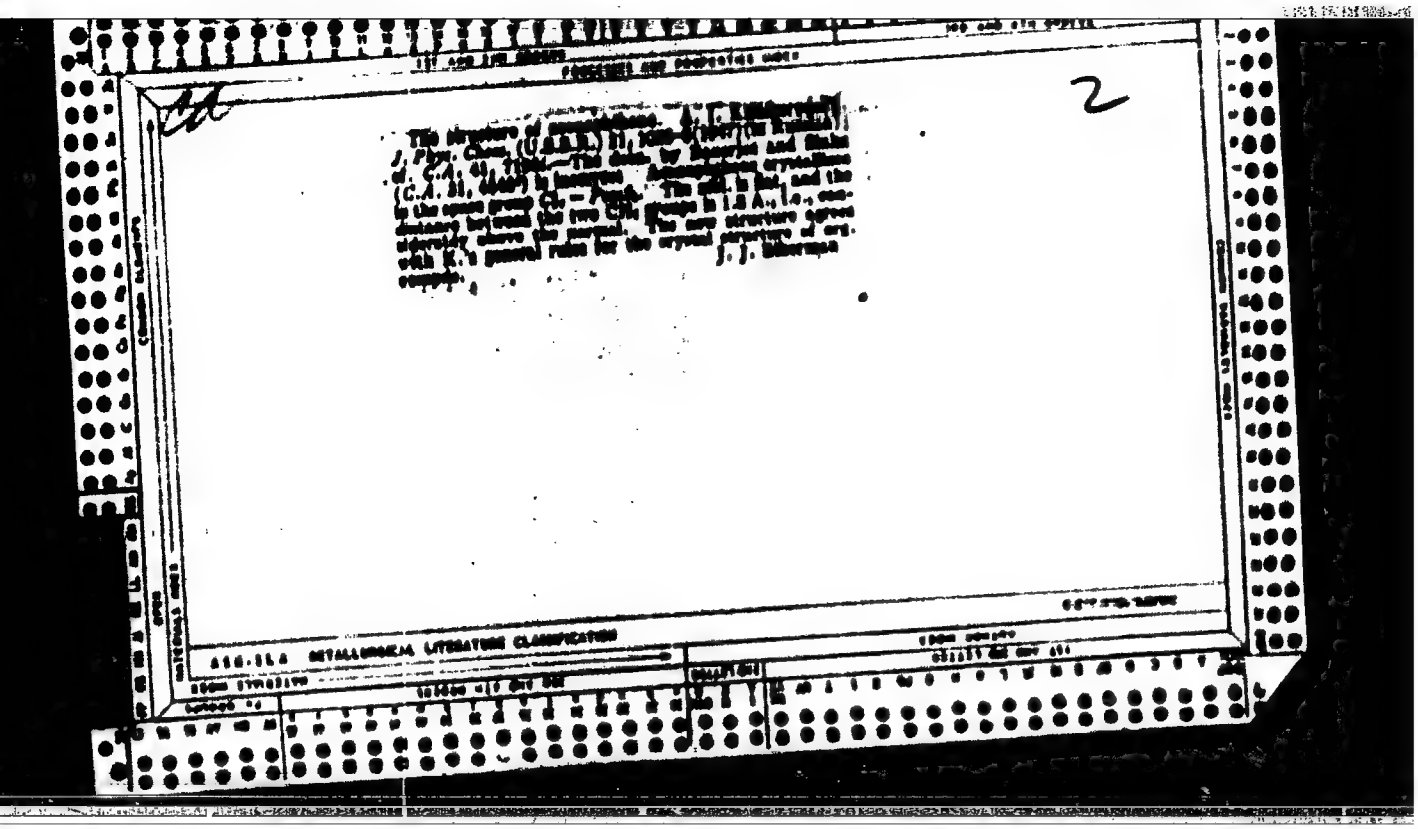


B

32

*1937. Determination of the Maximums of the Fourier Series in Structural Analysis. (In Russian.) A. I. Kitaigorodskii. *Journal of Technical Physics* (U.S.S.R.), v. 17, Sept. 1947. p. 1003-1010.

Accuracy of the method of series is analyzed and a new formula permitting determination of probable error in location of atom centers is set up. Several practical applications of the method are indicated.



KITAIGORODSKI, A.

PA 9720

USSR/Crystals - Structure
Crystals, Organic

Feb 1947

"The Crystal Chemistry of Aromatic Compounds: III, The Packing Coefficient in Organic Crystals," A. Kitaigorodski, 10 pp

"Acta Physicochimica" Vol XXII, No 2

The author defines the packing coefficient of molecules as $k = \frac{vZ}{V}$ where V is the volume of the unit cell of the crystal, Z the number of molecules in a unit cell, and v the volume of the molecule, i.e., the volume of the space confined within the spheres of intermolecular radii drawn from the centers of the atoms.

9720

KITAYGORODSKIY, A.I.

PA 50T91

USSR/Physics — Jan 1947
Crystallography
Twinning

"N. V. Belov's Book, 'Structure of Ionic Crystals and Metallic Phases'," A. I. Kitaygorodskiy, 2 pp

"Uspekhi Fiz Nauk" Vol XXXIII, No 1

Reviews 236-page book, with 174 illustrations, published by Academy of Sciences, USSR, 1947. Can be considered continuation of work carried out by Fedorov. Shows possibility of studying all crystals from one viewpoint: 1) symmetry of plane packs; 2) spaces between plane packs; 3) structural motives of AX_1, AX_2, etc.; 4) structures with coordination

IC — 50T91

USSR/Physics (Contd) — Jan 1947

numbers 8 and 12; 5) pseudosymmetry and twinning; and 6) new structures, based on the principle of plane packs.

IC — 50T91

KITAYGORODSKIY, A.I.

USSR/Physics
Molecular Structures
Academy of Sciences

Feb 1947

"M. V. Vol'kenshteyn's Book, 'Structure of the Molecule'," A. I. Kitaygorodskiy, 1 p

"Uspekhi Fiz Nauk" Vol XXXIII, No 2

Vol'kenshteyn intended to interest student as well as physicist in structure of the molecule. In spite of shortcomings and some rather obvious mistakes pointed out by reviewer, book is noteworthy contribution to Soviet science. Published by Academy of Sciences as "Scientific Research Journal, Monograph Series," 1947, with 270 pages, 133 illustrations, and 49 photographic plates.

20893

KITAYGORODSKIY, A. I.

USSR/Chemistry - Organic Compounds Oct 1947
Chemistry - Crystals

"Principles of Organic Crystallochemistry," A. I. Kitaygorodskiy, Inst Org Chem, Acad Sci USSR, 2 pp

"Dok Akad Nauk SSSR" Vol LVIII, No 1

Principle of solid packing limits symmetry of distribution of molecules in crystal. Formulates law of crystallochemistry: crystals of organic compounds can be looked upon as a system with a very solid form of packed layers. Molecules of the layer have a coordination number of 6 and are so distributed that there is no polarity to a pendicular layer. Submitted by Academician A. N. Nesmeyanov, 21 Mar 1947.

CA

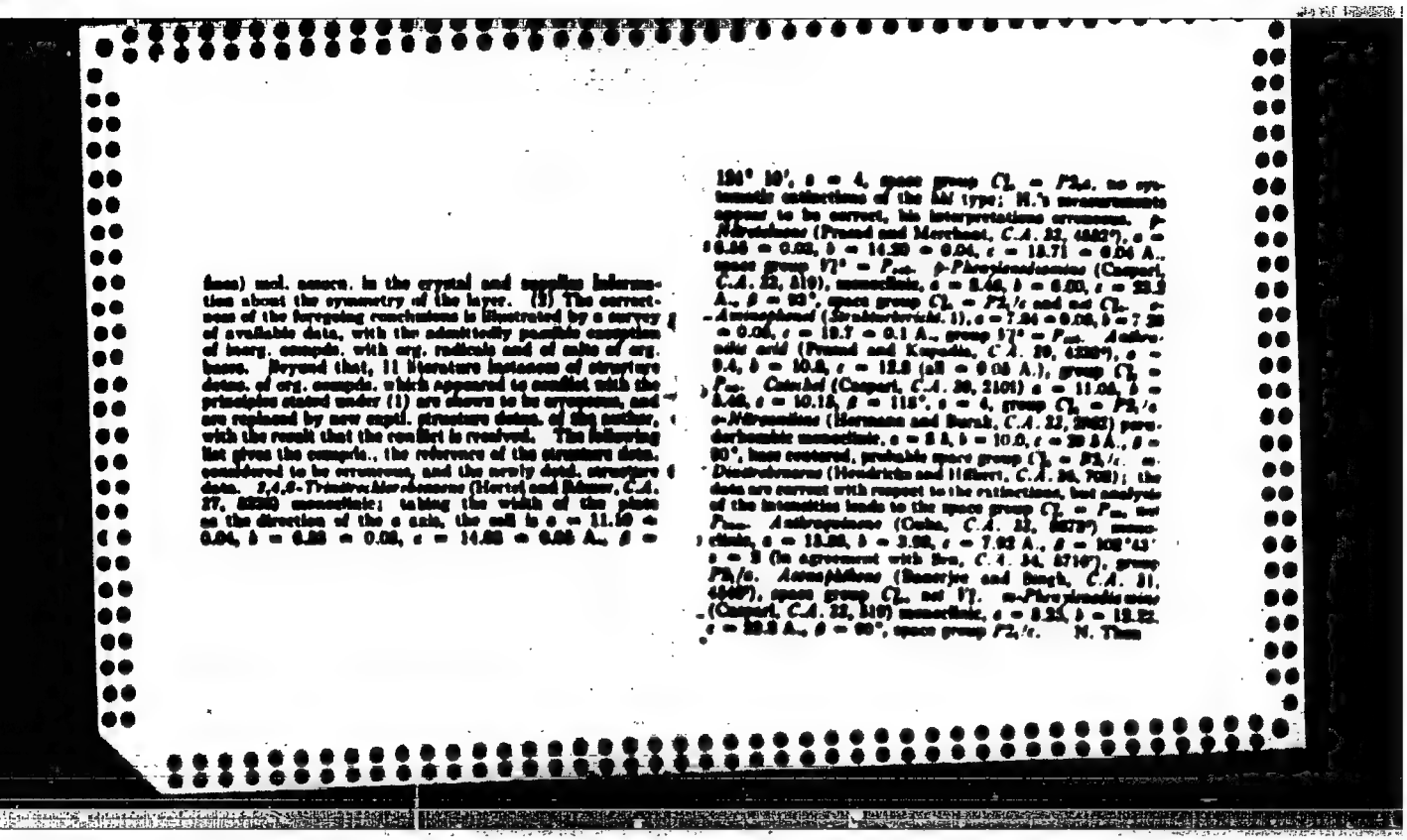
2

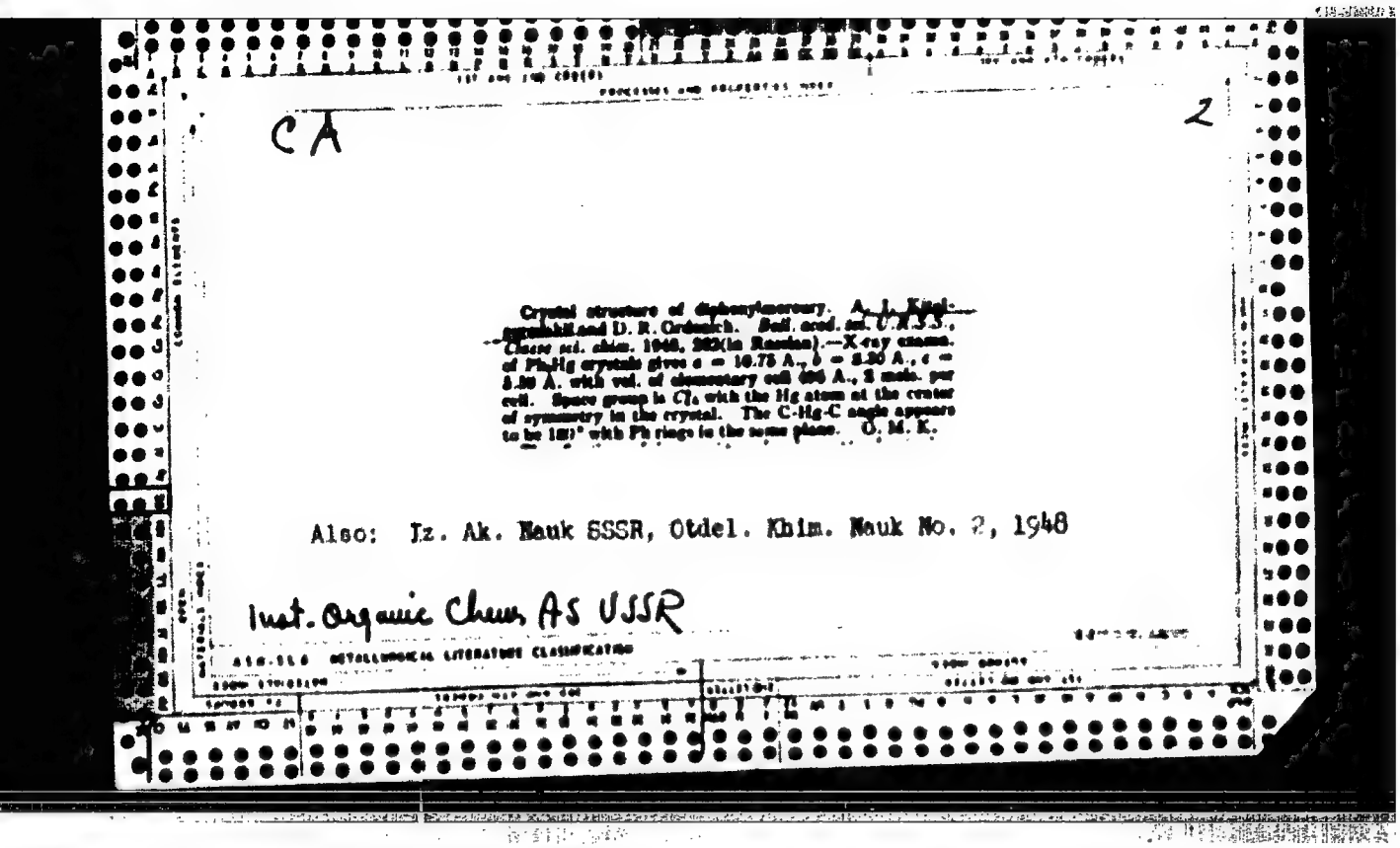
Crystallochemistry of aromatic compounds. VI. Space groups of crystals of organic compounds. A. I. Kitaigorodskii. *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1946, 273-88; cf. *C.A.* 40, [illegible].—(1) The principle of closest packing is reformulated to state that crystals of org. compds. are systems of closest-packed layers of mols. of coordination no. 6 and disposed in such a way that no polarity exists perpendicular to the layer. This is based on the postulates that an org. mol. in the crystal possesses a definite shape, and that the requirement of closest packing is predominant. Of the 80 possible layers derived by Alexander and Herrmann (*Z. Krist.* 70, 328 (1929)), 55 must be eliminated because of the incompatibility of quadratic and trigonal lattices with closest packing. Of the remaining, all but the 13 groups [illegible] are eliminated by the requirement that in order to achieve closest packing, the axes of the mol. must be orientable at any angle to the axes of the cell; this requirement actually excludes groups in which binary axes lie in the plane of the layer, groups with symmetry planes perpendicular to the layer, and groups for which the plane of the layer coincides with the glide plane. Analysis of the modes of superposition of layers consistent with the requirement of closest packing leads to the formulation of the space groups in which mols. of a given symmetry will preferably crystallize. The following table gives, for each mol. symmetry, the probable (or the possible) space group, crystal symbol, no. of mols. per unit cell, and no. of nonequiv. layers (i.e. not related by a symmetry operation). Mol. symmetry 1; probable groups [illegible] ; possible groups [illegible]. Mol. symmetry m, mm: probable groups same as for 1; possible groups [illegible]. Mol. symmetry 2, mm, 222: probable groups same as for 1; possible groups [illegible]. Mol. symmetry $\bar{1}$, 2/m, mmm: probable groups [illegible]; possible groups [illegible]. The tendency to max. lattice symmetry, although it never takes precedence over the requirement of closest packing, may result in a greater frequency of groups designated as "possible." With regard to the relation between the symmetry of a mol. and its symmetry in the crystal, the available data lead to the following partial conclusions. A mol. of symmetry mmm or 2/m keeps in the crystal a symmetry center and only that; a mol. of symmetry mm either loses all its symmetry elements or keeps the symmetry m or 2; mols. of symmetry m mostly lose their symmetry in the crystal; plane mols. possessing a symmetry plane passing through all the atoms, always lose that symmetry in the crystal. A no. of mols. per unit cell higher than that indicated in the table given, expresses (and de-

(over)

[illegible]

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION





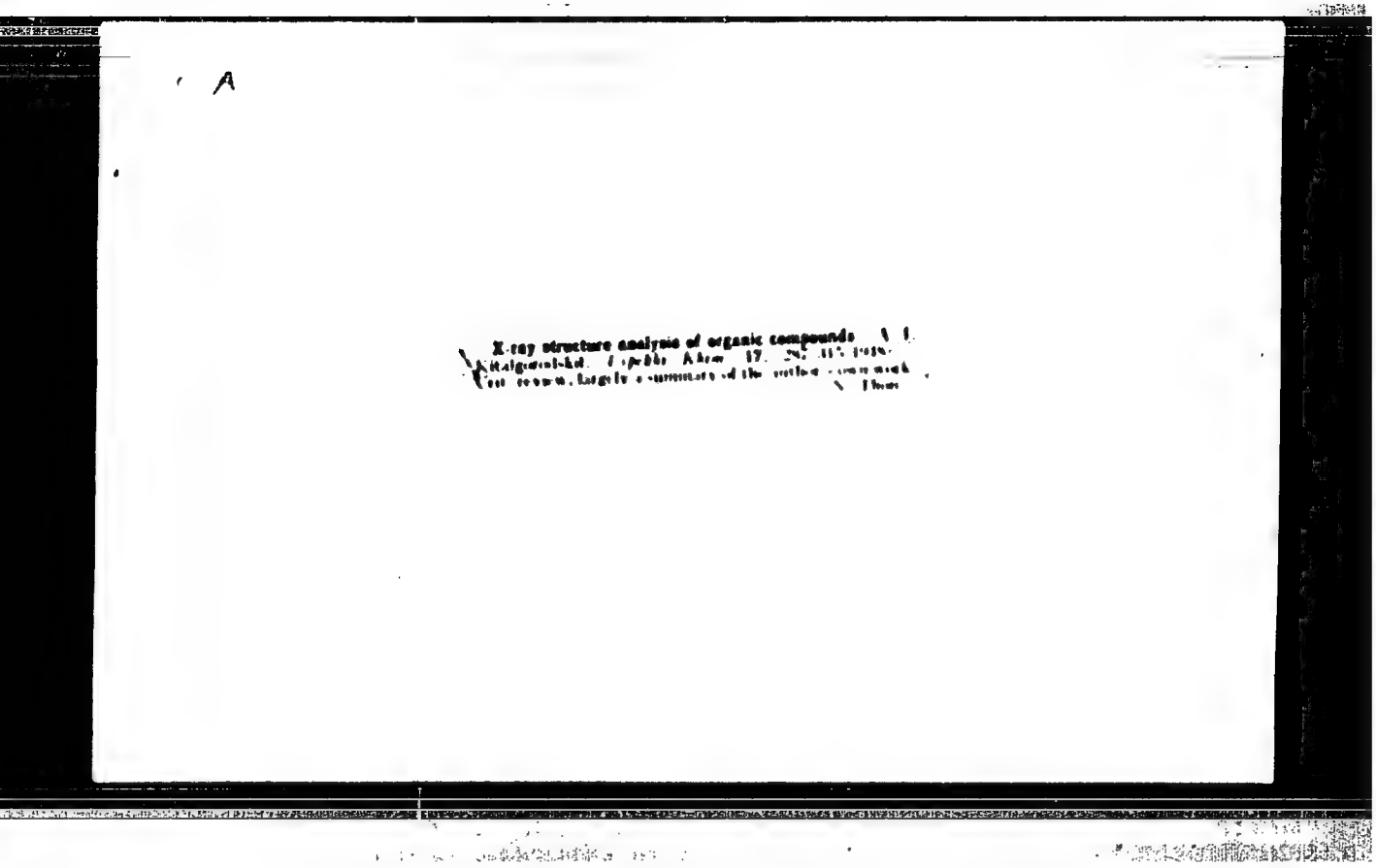
CA

2

Crystal structure of diphenylmercury. A. I. Kitaigorodskiĭ and D. R. Orbeladze. *Zhur. obshch. khim.* 1948, 282(in Russian).—X-ray examn. of Ph_2Hg crystals gives a = 10.75 A., b = 8.20 A., c = 8.30 A. with vol. of elementary cell 896 A.^{3}, 4 mols. per cell. Space group is C_{2v}^5 with the Hg atom at the center of symmetry in the crystal. The C-Hg-C angle appears to be 180° with Ph rings in the same plane. O. M. K.

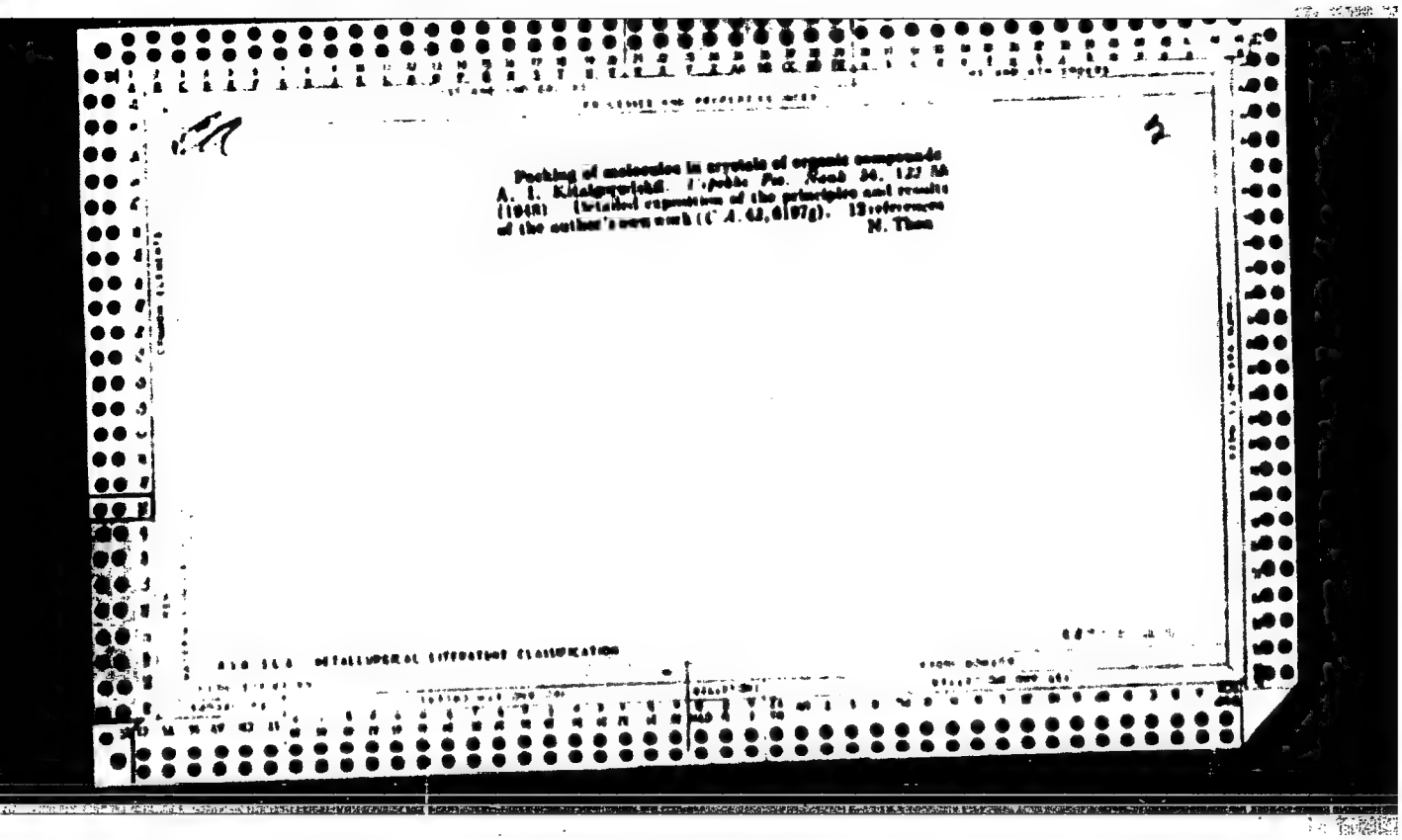
Also: Iz. Ak. Nauk SSSR, Otdel. Khim. Nauk No. 2, 1948

Inst. Organic Chem AS USSR



A

X-ray structure analysis of organic compounds



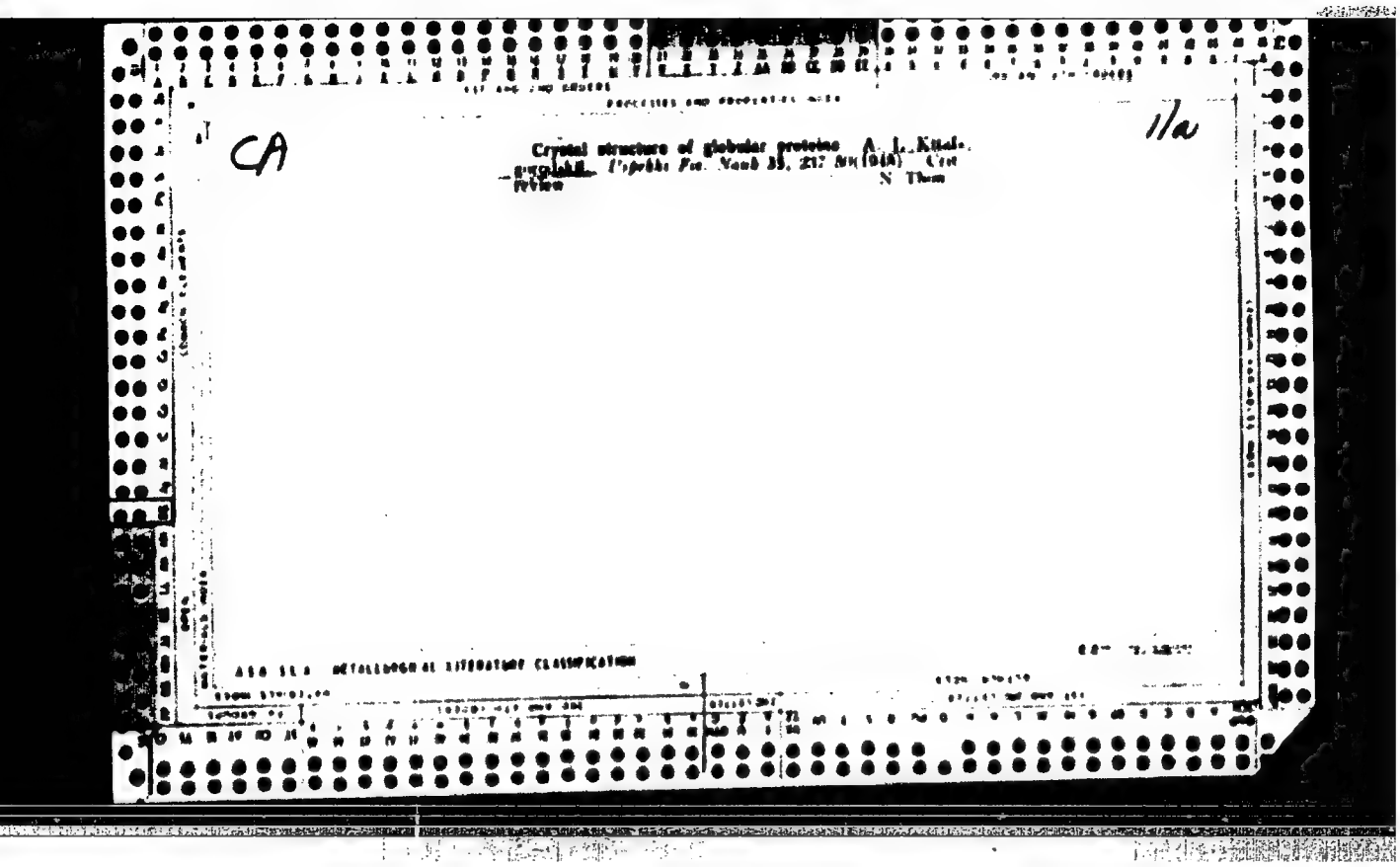
Packing of molecules in crystals of organic compounds
A. I. Kitaigorodskii. Uspekhi Fiz. Nauk 30, 123 MA
(1946) (detailed exposition of the principles and results
of the author's own work (C. A. 42, 6197g). 12 references
N. Thon

KITAYGORODSKIY, A. I.

"Review of W. T. Sproull's Book 'X-rays in Practice'." Uspekhi Fiz. Nauk 35, No. 1, 1948.

KITAYGORODSKIY, A. I.

"Review of N. D. Papaleksi's Book 'Course in Physics, Vol 2," Uspekhi Fiz. Nauk 35, No. 2, 1948.



KITAYGORODSKIY, A. I.

"Measurement of Roentgen Dispersion Caused by a Monocrystal with the Aid of a Geiger Counter," (British). Uspekhi Fiz. Nauk 36, No. 4, 1948.

KITAYGORODSKIY, A. I.

"The Structure of Matter," Nauka I Zhizn' No. 4, USSR, 1949.

CA

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Crystallochemistry of aromatic compounds. VII. Pseudosymmetry of the internal structure of crystals and its application in the structure analysis in the instance of some organic compounds (acenaphthene, α-naphthol, γ-hydroquinone). A. I. Kitaigorodskii (Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, [illegible]; cf. *C.A.* 43, [illegible].—Although the symmetry of a crystal does det. universally the x-ray extinctions, inferences as to symmetry based on the observation of extinctions involve, along with a probable symmetry, also further possible symmetry classes. Extinctions $h0l$ for $h \neq 2n$ in a monoclinic crystal of the class C_2 indicate a probable screw axis, with a point x, $1/2 + y$, z corresponding to each point xyz, but the possibility is left open for a group wherein a point $x + a$, $1/2 + y$, $z + b$, corresponds to a point xyz. This latter relation is termed a "pseudoaxis." In an analogous way, a pseudo-slip plane, perpendicular to the b axis, is defined by the correspondence $1/2 + x$, $y + a$, $1/2 + z$ to xyz, where, again, a can have any value; even though this relation does not correspond to a true symmetry, it will give rise to extinctions $h0l$ at $h + l \neq 2n$ typical for the slip plane. A pseudo-center of symmetry can be defined if the points of a cell are divided into 2 groups, each of which forms a centered lattice of its own, e.g. with the correspondence $xyz \to x + 1/2$, $y + 1/2$, z and $x_1y_1z_1 \to x_1 + 1/2$, y_1, $z_1 + 1/2$; this results in extinctions hkl on condition that both $h + k \neq 2n$ and $h + l \neq 2n$. The application of the concept of pseudosymmetry is illustrated by the following 3 examples: (1) Acenaphthene, orthorhombic, a = 8.3, b = 14.0, c = 7.3 A., 4 mols. in the cell, extinctions $0kl$ at $l \neq 2n$ and $h0l$ at $h \neq 2n$. The probable symmetry is V^5, but if one assumes a pseudo-axis A, further possible symmetry groups are $C_{2v}^2 = P_{2}cm$, $C_{2v}^9 = P_{2}1n$, and $C_{2v}^{?} = P_{?}cn$. By the principle of close packing, and by considerations of geometry and dimensions, the 2nd and 3rd possibilities appear excluded. A symmetry V^5 with a simple symmetry axis along c and a pseudo-slip plane perpendicular to a is acceptable on consideration of geometry but is invalidated by the analysis of intensities, the Patterson series on the ab plane having but one marked max. at Δx = 0.000, not at 0.30 and 0.17. This leaves only the possibility C_{2v}^9 with mols. occupying 2 mirror planes not related by symmetry, which gives rise to a pseudo-axis in 2 layers. (2) α-Naphthol, monoclinic, a = 13.0, b = 4.80, c = 13.4 A., β = 117° 40', 4 mols. in the cell, extinctions $h0l$ at $h \neq 2n$; $0k0$ at $k \neq 2n$, and $hk0$ at $h \neq 2n$. The latter indicate a pseudo-symmetry plane, perpendicular to c with slip along a, and a true space group $P2_1/a$. The pseudo-symmetry is possible only if the center of the naphthalene ring lies at x = 0.25, y = 0, the origin being the inversion center of the crystal. The O atom must be on the same line as the center of the ring. The structure is completely characterized by the coordinate of the mol. center 0.343 c/c, and the Euler angles φ_1 = 35, φ_2 = 65, φ_3 = 74.5°. (3) γ-Hydroquinone, monoclinic variety (obtained by sublimation of the rhombohedral form through filter paper) a = 12.2, b = 5.18, c = 8.05 A., β = 107°, extinctions (at variance with Caspari, *C.A.* 21, 3600) $h00$, $00l$, and $0k0$, at h, l, and $k \neq 2n$; $hk0$ at $h \neq 2n$; $0kl$ at $l \neq 2n$; hkl at both $h + k \neq 2n$ and $h + l \neq 2n$. The 4 mols. of the cell must be so distributed that in the projection perpendicular to b repetition occur

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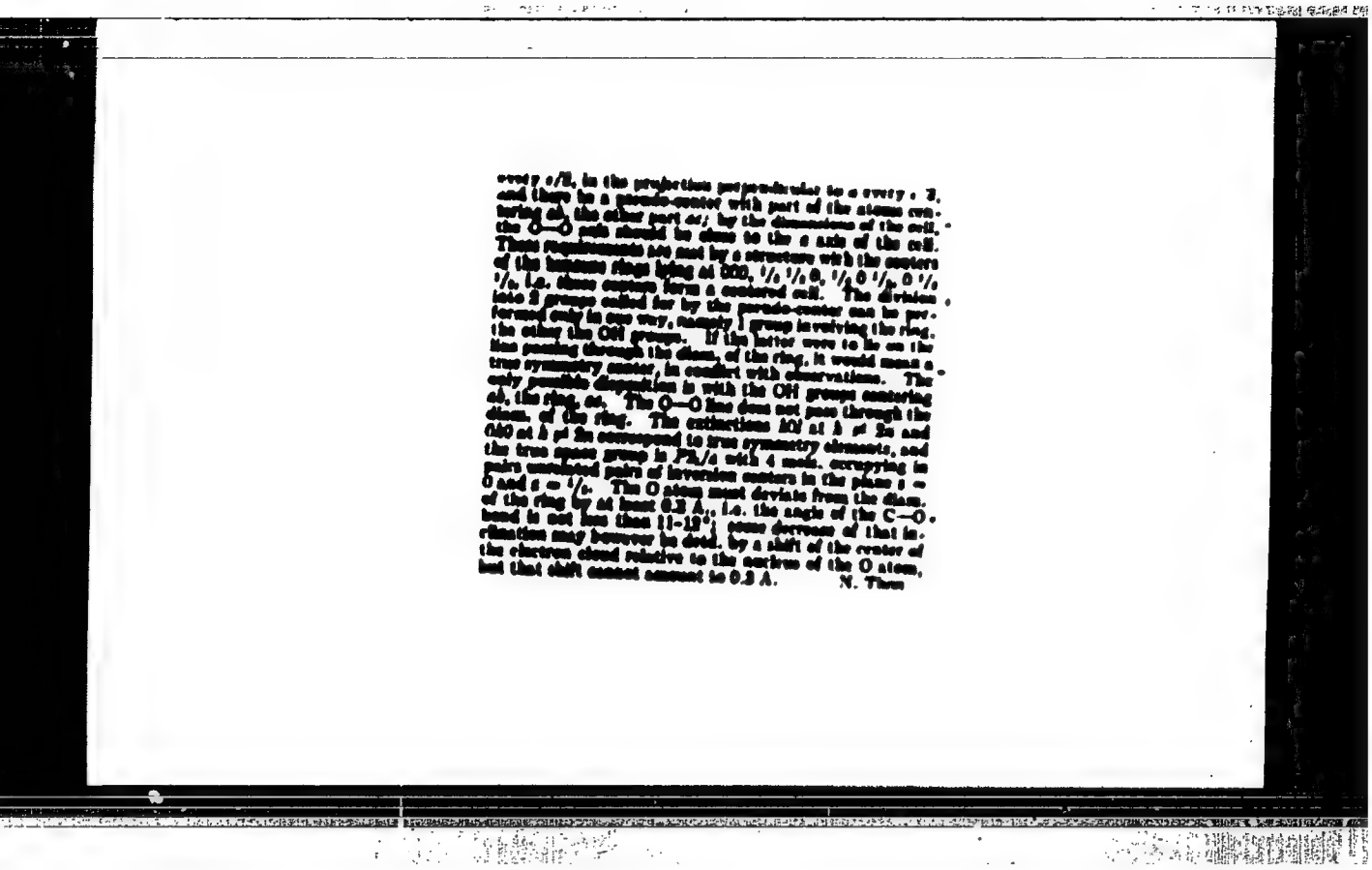

KITAYGORODSKIY

The Structure of Acenaphthene, and Certain Problems in Regard to the Method of X-Ray Analysis (original text in Russian), A. Y. Kitaigorodskii, J. Phys. Chem. (USSR) Sep '48 (23-9 [illegible]), pp 1036-1051; 9 illus, 11 R.

Acenaphthene crystallizes in a spatial group of $C_{2v}^{9} = P_{cm}^{3}$, with four molecules in the nucleus whose dimensions are a = 8,3; b = 13,98; c = 7,3 A. The structure of acenaphthene is composed of two layers of molecules not interconnected with symmetrical operation. The symmetrical line of molecules lies on the surface of the crystal symmetry. The molecule of acenaphthene is flat, the distance between the groups of CH_2 equals 1.64 ± 0.4 A, and the width of benzol nucleus equals 2.35 ± 0.1 A. The increase in comparison with the normal single C-C compound should be explained by the considerable tension present in the molecule. The reduction in width of the benzol nucleus down to 0,08 A apparently is also connected with these tensions. An assumption should be made that the organic molecule of the system is more flexible than required. The normal intervals for single and double-bonded compounds are accomplished only in simple structures not under tension. According to this it should be mentioned that the structure of naphthalene determined in relation to interatomic spaces is very inaccurate. It is also known that in naphthalene itself the benzol-nuclei can be investigated only in first approximation as normal hexagonals with a surface of 1.4 A.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

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Crystalline structure of mercury alkyl halides. D. B.
Grdenič and A. I. Kitaigorodskii. Zhur. Fiz. Khim. 23,
1161-71(1949); cf. C.A. 43, 7776a.—Several x-ray methods
applied to 0.03-cm. thick plates of compds. prepd. ac-
cording to Sletta and Jorneid (C.A. 33, 1870) gave for tetrag-
onal MeHgCl, EtHgCl, EtHgBr, and PrHgCl (all belong-
ing to space group $D_{4h}^{7} - P$(nmm)) a and c 4.00 and 9.30,
4.56 and 10.82, 4.60 and 10.62, and 4.70 and 12.68 A.,
resp., and for rhombic BuHgCl ($C_{2v} - P_{mn}$) a 4.10, b
5.24, and c 15.16 A. In the tetragonal crystals, Hg, halo-
gen and the center of the alkyl radical are situated on the
quarternary axis. The ordinates of Hg are 1.30, 1.31,
1.26, 1.28, and 1.28 A., resp. The Hg-Cl, Hg-Br, and
Hg-C distances are 2.68, 2.61, and 2.08 A., all ± 0.08 A.
The Me, Et, and Pr radicals seem to rotate about the c
axis, but the rotation must be synchronized to avoid col-
lision. I. I. Bikerman

KITAYGORODSKIY, A. I.

"Review of Ch. S. Barrett's 'Structure of Metals (Crystalographic Methods, Principles and Data)'." Uspekhi Fiz. Nauk 37, No 2, 1949.

KITAYGORODSKIY, A. I.

"Review of V. P. Tarasova and M. P. Shaskol'skaya's Translation of M. Burger's Book, 'Roentgen Crystallography'." Uspekhi Fiz. Nauk 37, No. 3, 1949.

KITAIGORODSKIY, A. I.

"The Fundamentals of Organic Crystallochemistry," received a D.I.Mendeleyev Prize for 1946 and 1949.

Vestnik AS USSR 3/50
M-12748

KITAYGORODSKIY, A. I.

PA 163T96

USSR/Physics - X-Ray Analysis Crystals — Apr 50

"Accuracy of Roentgen-Structural Analysis of Crystals," A. I. Kitaygorodskiy, Inst of Org Chem Acad Sci USSR

"Zhur Tekh Fiz" Vol XX, No 4, pp 397-411

Kitaygorodskiy analyzes problem of accuracy of determination of values of electron density and coordinates of centers of atoms in crystals. He introduces formulas giving error of these quantities as functions of the nature of the structure

163T96

USSR/Physics - X-Ray Analysis (Contd) — Apr 50

and conditions of the experiment Includes procedures for executing X-ray analysis. Submitted 14 May 49.

163T96

KITAYGORODSKIY, A. I.

FA 170T99

USSR/Physics - X-rays
Book Report

Mar 50

"M. Burger's Book, 'X-ray Crystallography,'"
A. I. Kitaygorodskiy

"Uspekhi Fiz Nauk" Vol XXXVII, No 3, pp 401-4

Book report of the Russian translation, by V. P. Taranova and M. P. Shaskol'skaya under editorship of M. M. Umanskiy, from subject English-language book. Printed at Moscow 1948 by State Publishers of Foreign Lit; 484 pp, 252 fig.

[redacted]

170T99

KITAYGORODSKIY, A.

168T87

USSR/Physics - Molecules
Mechanics

Aug 50

"Review of V. I. Pavlov's Book, "Physics Course,' Volume I," A. Kitaygorodskiy

"Uspekh Fiz Nauk" Vol XLI, No 4, pp 565-569

Subject volume (published 1949, Gostekhizdat, 447 pp, 160 figures) is devoted to mechanics and molecular physics. Part I is a chapter on hydrodynamics and aerodynamics; Part II consists of 9 chapters, mainly on molecular kinetic theory of structure of matter.

[redacted]

168T87

CA

New facts on interatomic distances in aromatic compounds A. I. Kitaigorodskiĭ and S. S. Kotsubinskiĭ (Inst. Org. Chem., Acad. Sci. U.S.S.R.). *Doklady Akad. Nauk S.S.S.R.* 71, 889–892 (1950).—The accepted tenet that, in aromatic compds., all C–C distances are equal (1.40 ± 0.02 A.), is refuted by new data on the structures of 1,5-dichloroanthraquinone (I) and 1,5-dichloroanthracene (II). In I, monoclinic, space group C^5_{2h}, $Z = 2$, $a = 15.10$ A., $b = 4.00$, $c = 14.2$ A., $\beta = 92°50'$, no. of mols. in the cell 4, orientations of the mol. relative to the axes of the cell $\varphi_1 = -34°40'$, $\varphi_2 = 23.5°$, $\varphi_3 = 73.5°$, the C–C distances are C_9–C_{10} = 1.32, C_9–C_1 = 1.46, C_1–C_2 = 1.37 and C_2–C_3 = 1.38 A. In II, monoclinic, C^5_{2h}, $Z = 2$, cell constants, $a = 10.0$, $b = 4.05$, $c = 14.4$ A., $\beta = 95°10'$, no. of mols. 4, orientation $\varphi_1 = -20°20'$, $\varphi_2 = -21°$, $\varphi_3 = 75°$, C_9–C_{10} = 1.40, C_{10}–C_{10} = 1.37, C_{10}–C_1 = 1.44, C_1–C_2 = 1.37, C_2–C_3 = 1.38, C_3–C_4 = 1.32, C_4–C_{4a} = 1.42 [illegible]. Evidently, the double bonds, characterized by the distances 1.33–1.34 A., are to a large extent localized, and the single-bond distance is shortened. There is no over-all averaging of the bond distances as predicted by quantum mech. calcns.

UMANSKIY, Ya. S., TRAPEZNIKOV, A. I. and KITAYGORODSKIY, A. I.

Rentgenografiia (X-Rays Applied to the Industry), 310 p., Moscow, 1951.

KITAYGORODSKIY, A. I.

PA 187T87

USSR/Physics - Crystallography Mar/Apr 51

"Analyzing the Results From the Structural Investigation of Crystals," A. I. Kitaygorodskiy, Inst of Org Chem, Acad Sci USSR

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 2, pp 157-163

Results of structural investigations clarify the position of atoms in the elementary structural unit. The accuracy with which the coordinates of the "centers" of atoms are detd has recently become the object of detailed investigations and discussions. Intra-atomic distances

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USSR/Physics - Crystallography (Contd) Mar/Apr 51

of complex structures have deen detd with accuracy up to 0.01 Å in the best cases and 0.05 Å in others, by the complete use of all possible intensities of the reflected rays. Author discusses steric interaction (hindrance), flexibility of the valence angle, and analysis of the forces. Kitaygorodskiy's lecture was discussed by the following persons: V. I. Kasatochin, Moscow, G. S. Zhdanov, Moscow, and N. V. Belov, Moscow; the latter 2, in opposition to the 1st, agree that Kitaygorodskiy has proposed a new method for the analysis of structure. Submitted at 3d All-Union Conference on Use of X-rays in Study of Materials held 19-24 Jun 50 in Leningrad.

LC 187T87

KITAYGORODSKIY, A. I.

PA 187T90

USSR/Physics - X-ray Analysis, Crystallographic — Mar/Apr 51

"Determination of Chemical Formulas by the Method of Roentgeno-Structural Analysis," A. I. Kitaygorodskiy, Yu. T. Sturchkov, Inst of Org Chem, Acad Sci USSR

"Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 2, pp 176-178

Authors have X-rayed hundreds of chem compds during the 38 years of the existence of roentgeno-structural analysis. Their main efforts have been directed toward detg the distances between atoms in mols and crystals. In most cases the chem formula

LC — 187T90

USSR/Physics - X-ray Analysis, Crystallographic (Contd) — Mar/Apr 51

can be detd by subject method if some orienting data is 1st known, as in the case of penicillin. Submitted at 3d All-Union Conference on Use of X-rays in Study of Materials held 19 - 24 Jun 50 in Leningrad

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